THE AMERICAN ARCHITECT

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A MOTION PICTURE SET, DESIGNED AND EXECUTED UNDER THE DIRECTION OF ROBERT HAAS, *ARCHITECT*

This is a representation of a patio in an American house. It is a garden scene as constructed on the studio floor. The pool and fountain are substantially constructed to use actual water. The floral decorations are living plants. The steps and platform were built with sufficient strength to support the players during a part of the action.

The Architecture of Motion Picture Settings

Illustrated by Examples of the Work of Robert Haas, Architect, for Famous Players-Lasky Corporation

MORE than two years ago THE AMERICAN ARCHITECT, in commenting on the development of motion pictures, ventured the opinion that as the cinema settings were not problems of color but chiefly of correct and pleasing adaptation of forms to spaces, it would be logical to expect them to be solved by the architectural profession.

At the earliest stages of the cinema, it was an art strongly influenced by the theatre and the scenery was such as had been supplied by scenic painters for the stage. Subsequently, well-known painters and decorators were engaged for the work. But now, within the past year, the larger and more successful producers have been engaging architects to plan and superintend the building of their "sets." The results are so satisfying that the differentiation between stage and cinema design now seems to be clear—the former is one of the decorative and the latter of the structural arts.

It is a fertile field for architects. With the results of invention so quickly materialized, with freedom from the whims of clients and from the practical exigencies of contractors, and with the subsequent possibility of aesthetic experiments of a most pronounced character—it is a rare opportunity for

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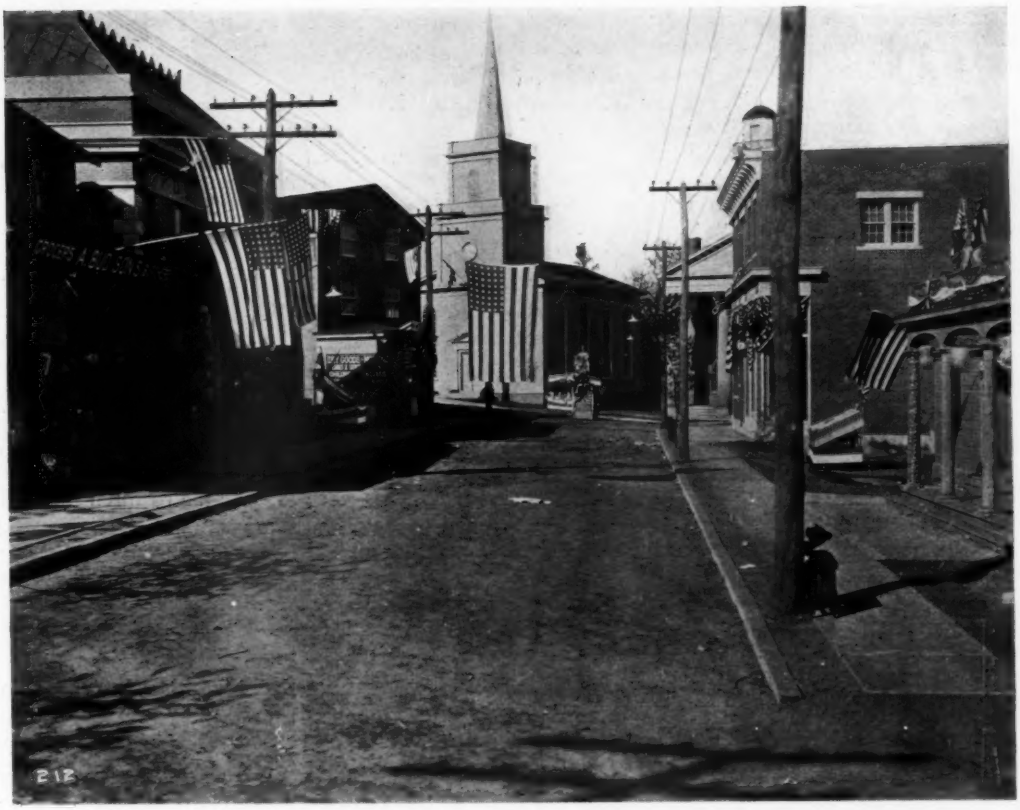
a richly creative talent. And it is a work, too, which is potentially one of our most powerful educational forces. The people, through this pastime, may be made familiar with that which is beautiful; they may see what good architecture and well-arranged interiors look like. Fortunate it is that the times are past when, if they went to the "movies," they must deprave their taste with everything that was bad.

The settings are now coming within the influence of trained architectural skill. We may, for this reason, safely expect interesting and perhaps even an inspiring architectural development in the newest of the arts.

IT seems almost banal to indicate the educative power of the motion picture. As a factor of instruction the screen has been recognized by commerce, by moral propagandists and even by the governments. During the Great War it was the means of suggesting the aims and showing the methods of armies. It attracted recruits as posters and as speeches never could and it aroused patriotism with its presentation of the magnificent panoply of war. These results were achieved not solely by the pictures issued by the governments obviously for such a purpose, but indirectly and powerfully by those scenarios sketched against a romantic background of war. In these fictional presentations the educative influence has been far more insidious. The audience opened its mind to the plot and the background made its certain impression—unsought, but effective. The motion picture should be taken seriously.

When the motion picture was nothing more nor less than a mechanical toy, plots were unfolded by characters who moved about in rooms such as never were inhabited by man. There were flat stairways painted quite out of the perspective of normal eyes, there were immovable palms of one dimension. The drawing rooms of English nobility were stuffed with onyx tables, with furniture of an unknown period, and with bric-a-brac such as even a parvenu would not be guilty of possessing. And when the exteriors were then shown, the beholder was astonished that they could contain the spacious halls and the palm trees, and so much furniture.

The development came rapidly. Producers realized they must do better than that. They began to take themselves and their productions seriously. There was a reaching for verities. Actual houses were sometimes temporarily rented for "properties" and finally the stage of growth has been reached where the entire background is conceived and built to fit the plot.



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This illustration, with the one on the opposite page, represent two periods in the life of an Illinois town, as constructed for the production of "The Copperhead." The land where the town stands was barren fields overgrown with underbrush, somewhere on Long Island, N. Y. The representation of the town as it appeared during the Civil War (shown on the opposite page) was finished after four weeks' work by the carpenters. All of the houses were actually constructed and roofed, and sufficiently well built to be used as living quarters. Note the comparison of the two scenes. The church and town hall are retained in the picture above and several other buildings are clumsily remodeled. There is a new postoffice. The brick gutters and concrete walks are replaced by asphalt. The kerosene street lamps are replaced by electric.

An architect who is engaged in this work says that he first reads the story and gets acquainted with the character who is to live in the scene which he must build. That character, fictitious, but of clearly defined tastes and habits, becomes his client. A house is to be built and rooms are to be decorated to suit such a personality. Perhaps it is a man who has lived for many years in the Far East or it may be an English gentleman living in Constantinople; in such cases the blend of two cultures must be evident. It may be a man shown at ten year intervals but living always in the same town —as in "The Copperhead." Here there must be no anachronism in showing the progress of the years and the individual taste of the character in his surroundings must be preserved. If an Italian inn is required, a Connecticut farmhouse will not do; the audience is too intelligent. Any one might wonder in what sort of a house Dr. Jekyll would have lived, or Adam Bede, or Robespierre—but it is a clearly defined problem for an architect to decide.

In his attempt to attain the proper effects, the architect draws his plans. And from his blue prints the carpenters build in actual materials, which are in some cases cleverly disguised as brick, or stone, or plaster. The house is very much as any house except that the ceilings may be missing, or the roof; a stairway may lead to a second floor which does not exist. It may be a house of thirty rooms, of which four only are to be used—the other twenty-six therefore are not drawn or built but are present only in the architect's mind and in the imagination of the audience.

Such an architect is not troubled with problems of durability or of plumbing. In three or four

days' time he directs the construction and interior decoration of the living rooms of an English manor, and its façade with spacious doorway. It stands for a day peopled by gentry meeting the climax of their lives. For one day the clocks tick on the mantels and the butler stands in the hall. For one day there is an illumination of glaring blue light and then the walls are torn down. A town house appears—pavement, steps, wrought iron railings and so forth. The Adam decorations of the interior have been discarded that l'art noveau may appear.

And though such scenes may occupy but a few minutes upon the screen at the theatre yet thousands of dollars are spent in their construction. For it is held fundamentally important that they shall be, with good taste, a reflection of the character of the mannikins who move before them. If fiction and drama record and develop the social aspirations of civilization, do not these backgrounds or "sets" record the surroundings in which the civilization lives and have they not the same potentiality for developing taste?

THROUGHOUT the winter months in the large cities there are held architectural exhibits which are prompted with a view of promoting good architecture and bringing to the general public a realization of what is being done and of what good architecture is. As a vehicle for achieving a similar purpose the moving picture should be taken seriously. It would not be contended that the finest development of architectural forms are shown on the screen, but it may be stated with assurance that the educative influence is there. The architects who do this work have the responsibility of widest influence in the molding of public taste. Wherever the film goes their influence extends. THE AMERICAN ARCHITECT, therefore, believes it does a valuable service to reproduce examples which show the trend in this field and to express the serious purpose which dignifies the work being done by one member of the architectural profession.

There may be in some minds a question whether the men who create two or three sided, roofless and impermanent buildings are architects—but this would seem to others a matter of overfine distinction and a splitting of hairs which ends in separation where there should be co-operation. It is in the same sense that there may be men who refuse to recognize Bakst as a serious artist; yet, without doubt, Bakst has made a profound impression upon the present generation's sense of color. In the long run it is the result that counts. It is the influence which the work of a creative imagination has upon the culture of its time and upon some specific expression of that culture. Just how much influence upon architecture the designer of buildings used for motion picture settings might have, clearly depends upon the distinction of his individual talent.

Impermanence of structure was never used as an argument against the serious purpose of a designer of buildings for an exposition. That a building is seen by the few and has made its influence vitally felt through means of the camera would never be held against the Parthenon. One fundamental fact which always remains is that an architect is at all times responsible, when he undertakes the creation of a building which shall serve the life of some individual or group of individuals, that he shall make that building a simple and beautiful expression of their needs. If the occupants don't need a roof he shouldn't build one, if they demand a Georgian façade but no rear elevation whatsoever, he fills their needs and nothing more. That is the architect, is it not? His work satisfies the requirements of his clients—be they imaginary or real, or he is no longer retained. And insofar as he transcends these requirements and envelopes them with beauty, thus far does he serve his profession and his generation. That is an aesthetic ideal, is it not?

IT has been contended, and with much insistence by men in the profession of architecture, that motion picture work as carried on after the methods shown in these illustrations was unethical and had a tendency toward commercialization. Further, it has been contended that ethically an architect could only render service in motion picture work as in a consulting capacity and that when he confined his work to a single client, he had in a sense taken himself out of the professional rank.

The inconsistency of such an attitude at once becomes apparent when we consider that large group of extremely competent men who are today engaged on architectural work for cities, states and the national government. When a man devotes his entire time to a municipality as superintendent of design and construction of its school buildings, he works for a single client at a salary. Or, when he competently acts as a State Architect, reforming the design and construction of its buildings, and acts as consultant on all the many vital matters that the well-trained architect is so competent to advise, and all for a salary—is he unethical? Probably if there were enough of these important and dignified offices to go around, we should find the public clamoring for architectural assistance and the only aid available would be that small group who shout ethics on every occasion, and who were sulking because they had been taken at their word and overlooked.

Like many another sweeping statement, this one of unethical commercialization of architecture in

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The two illustrations on this page show two views of an old street in London in the period 1850-60 as it was reproduced and used as a setting for the John Barrymore production of "Dr. Jekyll and Mr. Hyde." It was constructed on the studio floor of wood and plaster.

motion picture work is based on lack of knowledge of the actual and surrounding conditions. It would seem to be inconsistent for those men in the profession of architecture who insistently claim that architecture is entirely an art and resent with uplifted hand and arched eye-brows the very suggestion that it is in any way a business to declare unethical the work of an architect when competently directed toward the improvement of motion picture production. In work of this character the more sordid elements of construction are escaped and the aesthetic elements are raised to their highest position. The architect may witness the growth in a few days of a structure designed as a setting for an important gathering of people—that, if it were an everyday construction, he might wait for months for completion and perhaps with less satisfaction as to the results attained.

As was stated at the outset of this article, it is now a matter of years since this magazine first contended that there was a valuable field for architects in connection with the higher type of motion picture work, and it is believed that the thoughtful reader who will carefully examine the various illustrations reproduced with this series will be compelled to admit that there can be no more dignified, more valuable or more instructive work in architectural practice than is shown by the architect who has permitted us to avail ourselves of these examples of his work.

In a succeeding issue—probably that of July 21st—there will appear another article—from the standpoint of the producer—which takes up the matter of constructing motion picture "sets" and which gives some of the problems presented and tells how they are met.

This makes entertaining reading and presents for the first time informing facts of that half-way ground between reality and romance, which is the evening playground of so many of us.

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What Is an Architect?

Extracts from the Inaugural Address of John W. Simpson, President, R. I. B. A.

IN all the world's history, there has been never an epoch like that to which we are come. Four years of energy and skill have been devoted by the nations to the work of mutual destruction; and now they see, revealed by the light of peace, the precipice of ruin to which their struggles have brought them. Aghast at the imminent danger, they turn—still faint and bruised with fighting—to mend the neglected structure of their prosperity, to renew the arrested progress of their social welfare.

In these tremendous circumstances, I invite your attention to the functions of the architect. Plan—born of the fertile union of reflection, analyzing the conditions of the problem, with imagination, quick to perceive its true solution; construction, daughter of caution, testing the soundness of each audacious artifice. Such faculties, at once quickened and chastened by severe technical training, conduce—as I shall submit—to a type of intellect in the de-designer of buildings which is a national asset; an instrument to be employed to its very limit at this present time.

* * *

What is an architect?

There can be no better definition than that given by the dictionary of the Académie Française: "The artist who composes buildings, determines their proportions, distributions and decorations, directs their execution, and controls the expenditure upon them."

First then, foremost, and above all, he is an artist. And by the term artist, I understand no more a painter, or a draughtsman, than I do an actor, or—for that matter, a hairdresser—but that which all who honestly practice those professions would wish to be; delighting in their work for its own sake, yet discontented with it because of perpetual endeavor to reach a higher perfection. Not that fitful dilettante who justifies himself his idle hours with empty phrases—"a lack of inspiration," or the like—but a man with a life's work before him, and the time desperately inadequate in which to do it. A man of remorseless severity in the standard of his own attainment, insomuch that he shall grudge no expenditure of time and pains to achieve the smallest improvement in his work. One in whose mouth the words "it will do," and "near enough," are not found; nor will he tolerate them in the mouths of those who work with him.

With such a temperament, imagination, an eye trained to the appreciation of form and color, and the rare creative faculty, endowed with all attributes of the artist—he is yet but an imperfect architect. For to the artist must be added the technician, to make the architect. Of what avail is his gift of creation, if he have not constructive science that alone shall enable the offspring of his vision to reach maturity?

And, what a very mountain range of obstacles now appears between our eager artist and the promised land of his desire. Not seldom, indeed, his heart fails at the steep ascent, and either he turns aside into by-paths which he conceives easier or more direct—or, he becomes fascinated with the very ruggedness of his toil, and remains contentedly constructing, with never a regret for what lies beyond his vision.

The artist, then, must train his unaccustomed feet to tread firmly the slippery planes of geometry; for he is to be able, you must remember, to delineate things, not merely as they exist, but as they are to be. Geometer and—that he may calculate—mathematician, he must still surmount and master the rocky intricacies of the trades. Mason and bricklayer shall he become, and carpenter to boot. The workers in metal must yield to him the secrets of their crafts, nor shall he rest till he has explored the whole mystery of material—rocks and trees, and sand which is by the seashore.

Something of an engineer he will find himself nowadays, being called upon to deal with steel as a familiar friend; recognizing its great possibilities, and—its limitations. He is but a poor designer who shall set aside materials as "inartistic"; rather should he recognize it as his duty, by masterful handling, to imbue them with beauty.

The study of hygiene is within his province; for he must be nicely studious in arranging all sanitary matters, and that not merely as to their general disposal. Judging no detail of pipe, trap, joint or fitting unworthy of attention, he must narrowly supervise each with the authority which is born of knowledge. Upon climate, aspect, rain-fall, subsoils, and all matters pertaining to the public health, he will be required to advise; and to plan aright the defences against those insidious, persistent foes of humanity, sickness and disease.

Armed, then, with this panoply of attainments, and the vigorous constitution proper for their exercise, yet another gift is needed for his full equip-

ment. The very weight of his intellectual armor may be his disadvantage and undoing, if it be not supported by that solid sense of proportion—those powers of inductive and deductive reasoning—which go to make what is commonly called "business ability."

And here we come upon our architect in an aspect quite different from any in which we have hitherto viewed him. An aspect, too, which perhaps most of all differentiates him from his brethren who take the arts for their trade.

For, consider his postion who is entrusted with an important work of architecture, and how his conditions vary from those of the painter or the sculptor. These last produce their work, agree terms of its purchase, and there's an end to the transaction! A mere matter of interchange, so far as finance is concerned.

But the architect, from the moment the building contract is signed, is invested with the discretion of an almost unfettered trustee. Vast sums of money are at his disposition, and are disbursed by his direction. None can tell, till such time as the work is completed and the cost reckoned, whether or no he has wisely and honestly acquitted himself of his stewardship, and obtained full value for the moneys entrusted to him.

A trustee, did I say? Nay, more; a very judge. As the employer lays down his gold, so the builder bestows freely his work at the word of the architect, neither doubting but that justice shall be done them. When I think of the unlimited trust and confidence which are placed in us day by day, year by year, by men of opposing interests, strangers moreover for the most part, who know us not at all in private life; when I think, too, that among both small and great, high and low, that trust and that confidence are justified—I profess I am proud of my calling. Mistakes are made, no doubt, "to err is human"; I have known cases of unpardonable oversight—but (I speak of those who rightly bear the title) who ever heard of a dishonest architect?

To prolong the list would weary you. I could speak of the necessary knowledge of accounts; of some familiarity with the law, as it affects the drawing of contracts, the rights of dominant and servient owners of easements, the complexities of building acts and such like mysteries; of the need that he should be able to express his views with clarity and terseness, whether in writing or in speech; of the architect as the "polite letter writer," dealing daily with the correspondence of a bishop.

You will say—I fear—that my sketch of the "complete architect" is but a fancy portrait, that so many accomplishments cannot crowd into the few years of a working life. My picture, it may be, is exactly true of none of us, as we are—I freely disclaim its likeness to the author—but it may stand for all of us—as we would be.

* * *

Be this of the workman as it may be. What of the work?

It will not have escaped you that, although the quality of artist stands foremost in the making of an architect, I have described in greater detail his faculties of construction and administration. It is with intention that I have chosen for my discourse these less familiar aspects of our art. To cultured minds, the æsthetics of architecture are a perennial interest, and, since buildings make appeal to the sense of beauty, the emotions they inspire must form the measure for their criticism. Yet it is seldom realized how much of the greatness of the art of architecture is due to the severely practical nature of its medium, to the necessity of expressing the artist's ideal in terms of cubic reality. When the enthusiast speaks of it as "frozen music," he is apt to forget that the freezing inspired, and is the very essence of, the music. For architecture is, above all, building; the calculated, right disposition of proportioned solids and voids—in other words, plan and construction; not the cornices, moldings and carvings which define the masses, add desired emphasis to light and shadow. To create it, no dexterous suggestive sketch suffices; no magic wand, nor lamp, nor potent incantation will raise it from the ground. Patient complex diagrams of geometrical projection, sown with myriad notes and figures, must show how bricks are placed in unseen foundations, and how joints of cunning fashion couple the roof beams.

But, for all that I have dwelt upon the material, I would not be thought unmindful of the spiritual aspect of our calling. "Morality, in fact, is architectonic; and goodness, for human nature, is the queen over truth and beauty." I quote from Addington Symonds. "Experience leads me," he adds, "to think that there are numerous human beings in each nation who receive powerful and permanent tone from the impressions communicated to them by architecture." Very great, therefore, is the importance of a prevailing standard of good design, of logical, comely compliance with our domestic and commercial needs.

I am not now thinking of great monuments. Placed in the hands of competent designers, the government housing scheme may effect ethical results of more value to the nation than the satisfaction of its physical demands. The clerk and the artisan, on their way to the morning train, pass by rows of dwelling places, ill planned within, monotonously vulgar without. "One of these days," thinks

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our friend, "I will have a house of by own," and in his mind the house of his desire shapes itself, like to those he daily sees. What an ideal! Yet how should it be otherwise? The only effective education of the public in architecture is the object lesson of good design.

All creative art must have a motive. Gaudet, in his wonderful "Cours d'Architecture," reveals the basic influence which governs our art, in an illuminating phrase. "The great architect of a period," says he, "is its social condition; the technician realizes, but does not create, the aspirations of his time." Yet, while it remains true that architecture reflects, and writes in stone, the history of its time, the legend is no mere transcript, but a conception whereby the fertilizing suggestion is transmuted, vitalized and perfected. Versailles owed its existence to the autocratic splendor of Louis XIV, but the minds that created it were those of Mansard, of Le Nôtre, and Le Brun.*

The pageant of Versailles has passed into the shades; there breathes no wind of life among the phantoms of that splendid court; alone, the artists' work remains, immortal. To us—as it did to them—inspiration must come from the living world, from them that are night to us, from the resistless, limitless future. For good or ill, the old order is well nigh gone; the short retrospect of our own lives tells of a mighty social change, and in the fruition of the new state, architecture must fulfil its glorious part. "Did you, O friend," said Whitman, "suppose democracy was only for elections, for politics, or for a party name?" and, "To the men and women of a country, its æsthetics furnish materials and suggestions of personality, and enforce them in a thousand effective ways."

To those impatient for results, let me say that economy in building is effected, not by the omission of ornamental details—and, indeed, it is but a poor design which needs them—but, by minute study of the plan and construction, upon whose importance I have already insisted. "Plan" means far more than the arrangement of rooms; it comprises the scrutiny of every foot of ground, its contours and subsoil, whereby foundation work is saved; it covers the economical disposition and grading of roads, the aspect of each house site, the water supply, lighting, drainage, and—in mnay cases—reasoned investigation of the general and local social problems incident to the formation of a township. "Construction," too, may be but a small thing, in—for example—a cottage roof; but to perfect it, so that wood, slate, lead and labor may be reduced in each of several hundred cottages, will perhaps need days of work and experiment. And the time lost in preliminary study is regained many fold in the end. To produce in bulk such comparatively simple things as shells needed months of preparation, but, when organization was complete, they poured forth like water from a pierced dam. So, houses, far more complex constructions than shells, will presently arise as by enchantment; the process has already begun.

Like religion, architecture, if it is to profit a nation, must be part of its daily life. It is in plan that lies the true economy—prevention of waste. Waste of time and energy, wandering about the tortuous passages of tube stations, where lifts are planned remote from trains, and fatuous stairs intervene between them and the platforms. Waste of property in the squalid hinder parts of main line stations, untidy sprawling areas dotted with lamentable sheds, and linked by bridges whose building has darkened and desolated streets of houses; waste which defiles and depresses whole communities. I mention "backs," because architecture is matter not only, as is sometimes thought, for fronts, but equally for backs and sides; for all, in short, that connotes orderly, cleanly life, and the beauty of efficiency.

* * *

War, like architecture, is an art, and is practised "according to plan." Its principles demand the same insistence on a leading motive, the same subordination of the part of the whole; and there is the hazard variant from which skill may make, or folly mar, success. The commander, like the architect, must work within the limitations of his budget, though his expenditure is counted not, alas, in terms of his employer's money, but of his men's lives! Marshall Foch, indeed, pushes the parallel still closer. "The development of the art of war is like that of the art of architecture. The materials you use for your buildings may change; they may be wood, stone, steel. But the static principles on which you house must be built are permanent."

Those who know me will not misunderstand; will not think me less enthusiastic for art, that I have dwelt almost wholly tonight upon plan and construction. Assuredly, I yield to none in my reverence for the sublime qualities of painting, music, sculpture. But, among the fine arts, architecture is unique in that it alone subserves utility. By reason of its very limitations—the intimacy of its relation to the needs of humanity, its incessant conformation with cosmic fact, and the rigorous severity of its principles—its votaries are compelled to understand widely, to see quickly and well, to be eclectic and tolerant while holding unsullied their own artistic faith. It is more particularly upon these

*"On ne peut pas, Sire, employer trop d'étude pour concevior quelque dessin qui réponda à la grandeur de vos actions. Comme elles ont surpassé tout se qui s'est fait dans les autres temps, il faudroit que leurs monumens fussent aussi au-dessus de tous ceux de l'antiquité."—*François Blondel*

grounds that I have ventured to assert the value of our profession to the state.

It is not among those callings which bestows great wealth on those who practise it. Few architects retire upon their earnings; fewer still leave riches at their death. Yet no art bestows greater fortune of pleasure upon those who give themselves wholly to its service; and what can money give besides?

To us, architects, the immortal words which Carlyle puts in the mouth of Teufelsdröckh yield their fullest meaning. "Not what I have," said he, "but what I do is my kingdom."

Standard Test for Schoolhouse Design and Construction

By Frank Irving Cooper, *Architect*

Chairman of The National Education Association Committee on Standardization of Schoolhouse Planning

POSSIBLY one of the most remarkable omissions in the literature on school building is the absence of any work upon the economical utilization of floor space in a modern departmental school building.

The subject is of great importance, in these times of high prices of materials and labor of all kinds. It is of importance, not only to the taxpayer, who must foot the bills, but to the artificers, who must gain their daily bread by work upon new structures. The artificers suffer when the high cost of school building prevents the carrying out of new undertakings.

The investigation undertaken by the Committee on Standardization of Schoolhouse Planning and Construction, of the National Education Association, purposed to determine—if such an ambition may be permitted—without speculations as to what might be ideal planning, what part of the modern school building could reasonably be declared as being used for the purpose of instruction, the object for which the building was erected.

For a historian, the story of the committee's tabulations, its comparison of data, and its experiments to discover the use of floor space in school buildings, will prove interesting reading. It reveals a condition of lack of interest and study on the part of those responsible for the school plan that passes belief.

Spaces in the school plans were marked as being used for purposes for which they were totally unsuitable. Spaces were marked for activities which, if carried on in the areas assigned to them, defied all sense of proportion in curriculum and class unit.

What our tabulators thought about these things is their own affair. The architects are safe because the tabulations were known only by numbers and complexity of findings meant little to the draughtsman and measurer of plans.

It is another story, however, when plans of new school buildings are seen, appearing in current magazines, plans based on old formulas apparently still serving architects as if they were beginners, instead of designers living in an age when all is motion. A schoolhouse plan should be luminous from its purposeful energy to serve the spirit of modern education.

Previous to the year 1920 there was progress, but the progress was, year by year, hardly measurable. The awakening and development of school life, since the tragedy of America's unpreparedness in 1916, has served to hasten the slow moving steps of progress in the science of school planning.

The building of school houses ceased during the war and now comes the reaction. Progress comes into her own. Natural law affirms that progress, which well nigh ceased, shall take on new energy and the educational and architectural world look to the committee of the National Educational Association for an accounting of its time, during the period of seeming inactivity.

The president of this society has very kindly intimated that this accounting shall be termed "The Next Step," and this indicates that steps have been already taken by which the committee has arrived at its present position; and because there have been previous steps, it may not be amiss to acquaint the reader with the standards adopted by the committee and already generally accepted.

The most important of these standards is called the Candle of Efficiency. This was determined upon after some two hundred school buildings had been tabulated, to discover how the floor area of each had been used. Step by step the statistical facts

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were obtained and averages taken; then these averages were assembled, tabulated and studied.

This Candle of Efficiency, with its six main divisions, is now being used in checking school plans in some of our most important architects' offices and the rules for measuring the floor spaces are here given, that an understanding may be had of the practical every day use of this measure.

C. Compute each floor and mezzanine separately.

D. The area of light wells, courts, air shafts, etc., are not to be included in floor areas.

E. In rooms and auditoriums which extend through more than one story the area of such space shall be deducted from the floor or floors through which it extends.

F. In the case of an Assembly Hall or Gymnasium which has a balcony, the area of such balcony shall be taken separately.

G. In figuring wall or partition areas, no door or window openings shall be deducted but the wall shall be figured solid as though no openings occurred.

H. Exterior walls and interior partitions are to be figured the finished thickness including any lath and plastering.

(Continued on page 13)

CHART FOR COMPUTATION FOR THE NUMBER OF ROOMS NEEDED FOR INSTRUCTION PURPOSES IN A SCHOOL BUILDING BASED ON ONE WEEKS PROGRAM

		FIRST YEAR					SECOND YEAR					THIRD YEAR					FOURTH YEAR					TOTALS					
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	
FORMULA →				A/B		C×D			F/G		H×I			K/L		M×N			P/Q		R×S	E+J+T		V/W			
SUBJECT	DUPLICATE USE	STUDENTS	MAXIMUM SIZE OF CLASSES	CLASSES REQUIRED	ALLOTMENT PERIODS	CLASS PERIODS	STUDENTS	MAXIMUM SIZE OF CLASSES	CLASSES REQUIRED	ALLOTMENT PERIODS	CLASS PERIODS	STUDENTS	MAXIMUM SIZE OF CLASSES	CLASSES REQUIRED	ALLOTMENT PERIODS	CLASS PERIODS	STUDENTS	MAXIMUM SIZE OF CLASSES	CLASSES REQUIRED	ALLOTMENT PERIODS	CLASS PERIODS	CLASS PERIODS	USABLE PERIODS	ROOMS REQUIRED	USABLE SPARE PERIODS	ACTUAL ROOMS REQUIRED	
									SPECIAL					ROOMS													
Home Economics Gen	Recitation	45	30	2	4	8	35	30	2	4	8	15	30	1	4	4	15	30	1	4	4	24	30	1	+6	1	2 Double
" " Voc							15	15	1	8	8	10	15	1	8	8	10	15	1	8	8	24	30	1	+6	1	4 "
Woodworking		25	15	2	4	8																8	30	1	+22	1	2 "
Printing							20	15	2	4	8											8	30	1	+22	1	2 "
Machine												8	15	1	10	10	8	15	1	10	10	20	30	1	+10	1	5 "
Mech Drawing		40	30	2	2	4	25	30	1	4	4	15	30	1	4	4	10	30	1	4	4	16	30	1	+14	1	
Free "		100	30	4	2	8	50	30	2	2	4	30	30	1	2	2	20	30	1	2	2	16	30	1	+14	1	
Music		130					90					70					60										Auditorium
Phys Training Boys		60	60	1	4	4	40	60	1	4	4	30	60	1	4	4	28	60	1	4	4	16	30				Gymnasium
" " Girls		60	60	1	4	4	50	60	1	4	4	40	60	1	4	4	32	60	1	4	4	16	30				
									LABORATORIES																		
General Science	Biology - Recitation	70	30	3	5	15	50	30	2	5	10											25	30	1	+5	1	
Chemistry												20	15	2	6	12						12	30	1	+18	1	
Physics																	15	15	1	6	6	6	30	1	+24	1	
									COMMERCIAL ROOMS																		
Business	Bookkeeping	40	30	2	5	10						21	30	1	6	6	20	30	1	6	6	22	30	1	+8	1	
Comm Geography	Stenography											30	30	1	5	5	25	30	1	5	5	15	30	1	+15	1	
Typewriting							30	15	2	5	10	30	15	2	5	10	20	15	2	5	10	30	30	1		1	
									STANDARD CLASS ROOMS																		
English		130	30	5	5	25	90	30	3	5	15	70	30	3	5	15	80	30	2	5	10	65	30	2	-5		
History & Civics		90	30	3	4	12	20	30	1	4	4	25	30	1	4	4	60	30	2	4	8	28	30	1	+2		
Mathematics	All rooms may be	100	30	4	5	20	60	30	2	5	10	20	30	1	5	5	15	30	1	5	5	40	30	1	-10	7	
Latin	used in duplicate	40	30	2	5	10	30	30	1	5	5	15	30	1	5	5	10	30	1	5	5	25	30	1	+5		
Spanish												30	30	1	5	5	15	30	1	5	5	10	30	1	+20		
French		40	30	2	5	10	35	30	2	5	10	20	30	1	5	5	20	30	1	5	5	30	30	1			

NOTE: THIS CHART IS BASED ON AN ACTUAL PROGRAM IN A SMALL HIGH SCHOOL. SPECIAL ROOMS, LABORATORIES AND COMMERCIAL ROOMS HAVE 164 SPARE PERIODS AND WOULD HAVE SUPPORTED MORE PUPILS BUT THE GYMNASIUM AND TYPEWRITING ROOM ARE IN USE DURING THE ENTIRE SCHOOL WEEK

Rules for measurement and tabulation of school buildings as formulated by the Committee on Standardization of Schoolhouse Planning and Construction of the National Education Association.

RULE 1. COMPUTING AREAS.

A. Line of measurement for area of all floors is to be taken at the outside face of exterior walls. Deduct all recesses which are the full story height.

B. The area of basement floor is to be measured from same line as outside wall of first floor.

EDITORIAL

Mr. Eggers' Sketches

IT was the announced purpose to commence in this issue the presentation of a series of sketches, specially made for THE AMERICAN ARCHITECT, by Mr. Otto Eggers, of old types of architecture in the United States.

Owing to the shortage of high grade print paper, on which it was proposed to present these drawings, it has been found impossible to print these plates in time for this issue, nor does it seem likely that they can first appear earlier than our issue of August 4.

Not What I Have, but What I Do is My Kingdom

ATTENTION of the reader is directed to an extract from the inaugural address of Mr. John Simpson, president of the Royal Institute of British Architects, printed in this issue.

Mr. Simpson asks, "What is an Architect?" and proceeds to give his conception of the attributes of a many sided professional man. It is both satisfactory and interesting to note that in stating the exact field in which the architect is in these days expected to function, Mr. Simpson is entirely in accord with the opinion so long urged by THE AMERICAN ARCHITECT. First and foremost contends Mr. Simpson, the architect is an artist. A man "delighting in his work for its own sake, yet discontented because of a perpetual endeavor to reach a higher perfection." This exactly analyzes the true mental attitude of the artist architect toward his profession. The perpetual endeavor toward a higher perfection is the straining for every last bit of knowledge that a man may acquire toward his work as an architect.

And in making this endeavor, the thoughtful man, early in his career, learns that he shall have to group with his inclination as an artist, many attributes that in his early or student days he firmly believed were incompatible with the artist's attitude toward his work. Just what all these things are Mr. Simpson has stated with profound knowledge. The poseur who aims to practice the fine arts generally is of a mentally lazy disposition, and it is his habit to create an impression among his listeners that all the practical elements that accompany his work are sordid and non-essential. Behind such a plea he shows an ignorance that is profound. It is the cultivation of such an attitude by architects that has led to certain well defined opinions of the general public that architects are impractical men. Thus, they have seen their once proud positions as Master Builders gradually declining and have been lazily willing to allow others outside of their profession to assume responsibilities which they, through inaction and consequent loss of ability, are not qualified to perform.

AS Mr. Simpson correctly puts it, the architect from the moment the building contract is signed is invested with the discretion of an almost unfettered trustee, a very judge. It is, therefore, necessary that an architect should be qualified to accept so great a responsibility. To dodge it on the plea that he is an artist and not also a business man is to shirk a responsibility.

More and more every day is this correct idea of the true meaning of the practice of architecture becoming accepted. Its general acceptance will result in more complete and modern forms of architectural education. Education is undoubtedly the cause of the present misguided views as to the true meaning of an architect's attitude toward his work. It will be by a devision of educational methods by the practical men of the profession that we shall become set upon the right road.

The education of the architectural student is not confined to that curriculum of study that he will for a certain course pursue at the the architectural school. It is largely influenced by the attitude or expressed opinion of men in his profession to

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whose spoken and written words he will lend a listening ear. It, therefore, becomes necessary that the man in practice should by careful consideration of this important question so bring his ideas up to the conditions of modern practice that he will not mislead his younger brethren, but by sound precept and good example show them that, while they are embarking on the oldest and greatest of all the arts, they are at the same time to become immersed in all the complex problems that attend every business venture.

The Architect and the Motion Picture

THERE appears in this issue the first of two articles, very fully illustrated, on the relation of architects to motion picture production.

As a means of educating the masses, and more particularly the large number of people in this country not yet fully Americanized, the motion picture is considered as of the highest value. Also the audiences have become extremely cultured, and to an extent that all producers know that to slight them by presenting "sets" not accurate in every detail is the worst possible business policy.

How was the public to become assured that the architecture shown on the screen was good, or simply florid, sensational or grossly inaccurate? This problem of placing the stamp of correctness on the architecture of "sets" was at once solved by a large picture corporation when they included in the "legend" that was shown prefatory to the running of the reels, the statement that the architectural and decorative effects were produced under the direction of a certain architect whose name was prominently displayed.

It was this unusual attribution of authorship, and commendably proper regard for the architectural verities that led to an investigation which resulted in the careful preparation of this series of articles.

It is erroneous to assume that the "sets" used by the larger motion picture producers are not in the truest sense structural. Visiting a large studio in New York City, there was found a carpenter shop of vast area, equipped with the most modern woodworking machinery and in which more than fifty skilled men were engaged in construction work. On the main floor of this studio, an equally large group were building in the most solid manner and decorating and furnishing the most substantial interior and exterior "sets."

Every detail was constantly under the direct supervision of the architect or one of his trained assistants. The basis from which this work was constructed were sets of plans and specifications as carefully drawn as if for absolutely permanent construction.

Motion picture sets constructed in this manner are sure to be as correct in their interpretation of architecture as any could be. The value of the architects work in their production is proven beyond question.

PATIO OF THE LIONS—THE ALHAMBRA

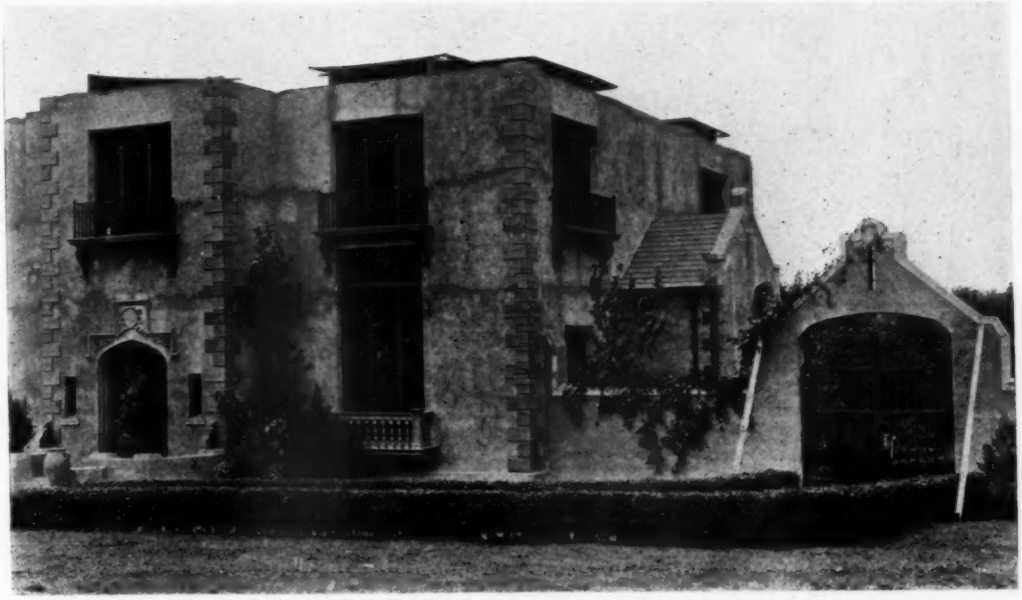
A MOTION PICTURE SET, REPRESENTING A FARMHOUSE, DESIGNED AND EXECUTED UNDER THE DIRECTION OF ROBERT HAAS, *ARCHITECT*

A MOTION PICTURE SET, DESIGNED AND EXECUTED UNDER THE DIRECTION OF ROBERT HAAS, *ARCHITECT*

As is apparent, this represents a canal in Venice which was constructed on the studio floor. The tank is about 120 feet long and was built deep and wide enough to permit the passage of two gondolas required in the plot for use in the production of "A Society Exile."

A MOTION PICTURE SET, DESIGNED AND EXECUTED UNDER THE DIRECTION OF ROBERT HAAS, *ARCHITECT*

This room represents the library of a wealthy and dignified New Yorker. As he was a self-made man and fond of splendor, the Empire style was thought to be the most suitable. The cumbersome desk in the left background was placed for a central spot of plot and action. Note the base of the pilaster and the caps which are so excellently brought out in the photograph. Three other rooms of this imaginary gentleman's house were built actually adjoining.



FOR THE REPRESENTATION OF AN AMERICAN COUNTRY HOME.

MOTION PICTURE SETS, DESIGNED AND EXECUTED UNDER THE DIRECTION OF ROBERT HAAS, *ARCHITECT*

A scene for use in "The Avalanche" to represent a Spanish inn. The building was not as a copy but a composite. All the walls are of real plaster and the stairs and platform are solidly built for use by the actors. There are entrances from the platform to three rooms in which subsequent action was carried on.

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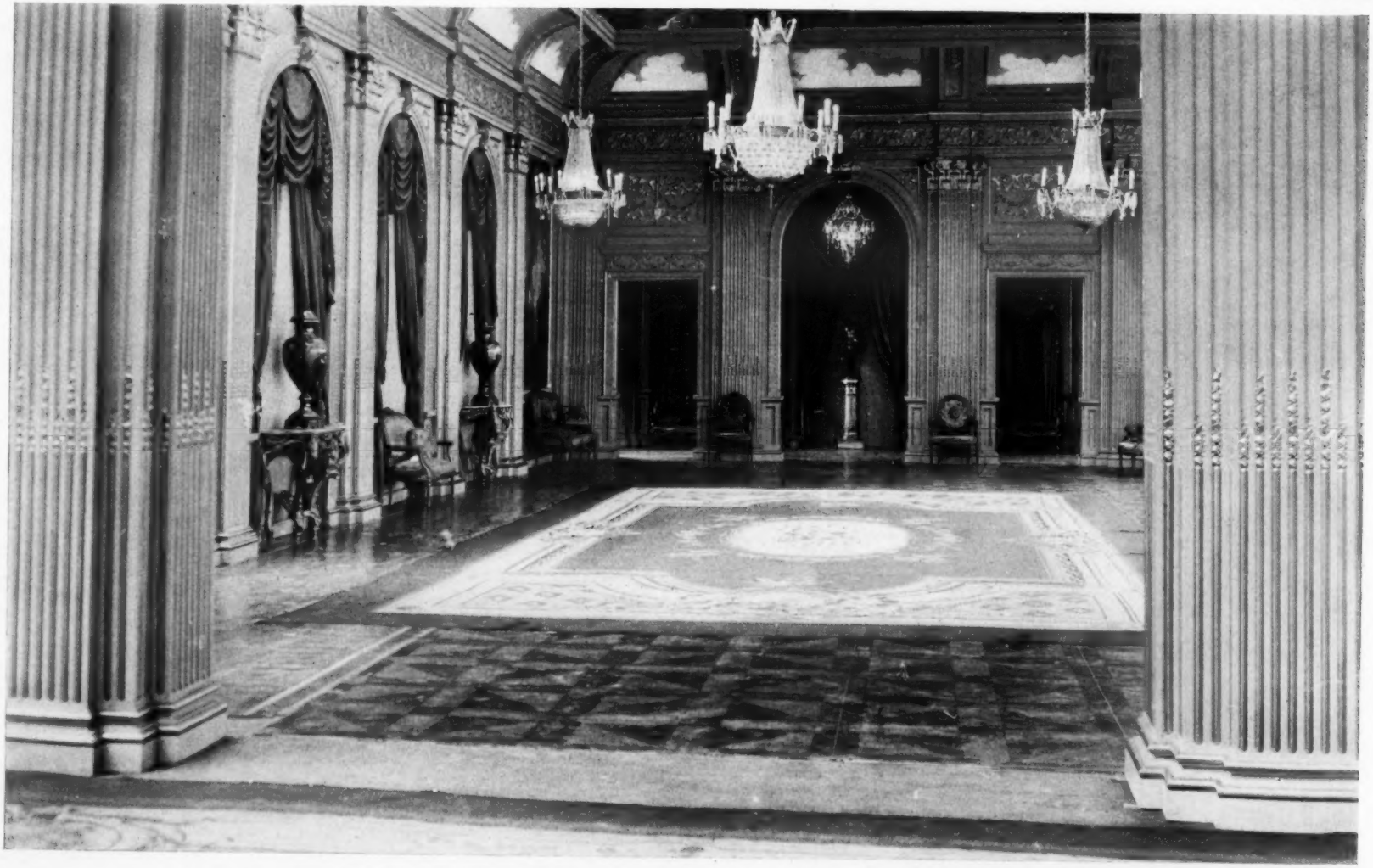
A MOTION PICTURE SET, DESIGNED AND EXECUTED UNDER THE DIRECTION OF ROBERT HAAS, *ARCHITECT*

Representation of an American country house of a style adapted from an Italian villa, used for the photoplay, "Erstwhile Susan," constructed out of doors, of wood and plaster. The rooms of this house, as used for the interior action, were built on the studio floor.

LIBRARY BOSTON



A MOTION PICTURE SET, DESIGNED AND EXECUTED UNDER THE DIRECTION OF ROBERT HAAS, *ARCHITECT*

A salon of the Elysee Palace, Paris, reproduced on the studio floor. This room occupies a space 80 by 120 feet. The walls are of wood ornamented with plaster. Note the presence of the ceiling cove and absence of a ceiling proper.

A MOTION PICTURE SET, DESIGNED AND EXECUTED UNDER THE DIRECTION OF ROBERT HAAS, *ARCHITECT*

A representation of a doorway in an American city, built on the studio floor. It is intended to suggest a house in an old and aristocratic quarter—such as Washington Square, New York. The door opens into a hallway, but the other rooms of the house were built separately.

A MOTION PICTURE SET, DESIGNED AND EXECUTED UNDER THE DIRECTION OF ROBERT HAAS, *ARCHITECT*

Façade of an American country house built of wood and plaster without interior rooms. Constructed out of doors.

Standard Test for Schoolhouse Design and Construction

(*Continued from page 10*)

I. Flues are to be figured to include all surrounding walls and partitions except interior walls and partitions figured under H.

J. Where closets or bookcases or dead spaces occur in a bank of flues, same are to be figured in as flue area.

K. Stairs extending a full story in height are to be taken as stair area. Steps not a full story in height are to be taken as part of the floor area of the room or corridor in which they occur.

L. Large piers occurring in rooms are to be deducted from floor areas and added to wall areas.

M. Chimneys are to be figured in as flue areas.

N. Area of each individual space is to be taken separately in accordance with schedule.

O. Areas of arcades, open porches, uncovered corridors, pergolas and open air theatres or auditoriums, are to be figured separately.

RULE 2. COMPUTING CUBICAL CONTENTS.

A. Ascertain the cubical contents of the building by multiplying the area of the first floor computed by Rule 1, by the height of the building from the underside of basement floor to the mean of the roof.

B. In buildings whose basements are not entirely excavated, multiply the area of the first floor computed by Rule A (areas) by the height of the building from the underside of the first floor to the mean of the roof. To this content add the cubical content of any space between the underside of the first floor and the surface of the excavation, and in addition add the cubical contents of any partial basement which may be found in the building.

C. When portions of the building are built to different heights, each portion is to be taken as an individual unit.

D. Projecting entrance porches are not to be included.

E. Porches, covered verandas, used for school activities and open air rooms and auditoriums are to be included.

The percentages of the Candle of Efficiency have given standards by which architects reach a better understanding as to whether their plans are well designed for economy of floor space.

The study of school building plans, taken the country over, revealed a startling variation between them. Even when the buildings were designed to house practically the same number of pupils, engaged upon similar lines of work, there was often no similarity between the details of the plans. It would appear that building programs are prepared and working plans made without comprehension of the fundamental facts covering the conditions of the work to be later performed by the teachers and pupils in the every day order of school exercises.

If the probable future program is laid out for a definite number of pupils and the type and number of rooms to fit this program is determined, a foundation of fact is laid, upon which to plan the lay out of the proposed new school building.

The success of the school in the use of a new building is largely determined before a line is drawn in the architect's office, by the care with which this future program is studied.

Once the foundation of fact above referred to is laid, the architect can make every dollar expended upon the new building carry a peak load, by spending at least fifty cents of every dollar for those parts of the building to be devoted to purposes of instruction.

A study of the fundamental facts and a determination of what is required, in the way of a building program to meet those facts, will enable the superintendent to face the financial world and demand, with every assurance of success, the appropriations required properly to carry on the educational program needed for the proper development of his town.

Our next step, therefore, is the development of a method, or rule, by which the general size of the new school building may be determined.

If we can do this, by the application of a method that will work the greater number of times it is tried, the planning of school buildings will no longer be a matter of opinions and guesses. The new building will be founded on a basis of fact. No argument is needed to prove that such a method is desirable provided it is confined to translating the superintendent's data, on the maximum number of proposed pupil occupants, and the course of study into the number and the size of rooms and their floor area required to accommodate a definite number of pupils, when engaged upon their school work.

The rule should solve this problem and should in no way hamper or interfere with the creative impulse of the skilled architect. Such a rule used with the per cents of the Candle of Efficiency will be the means of ending the confusion and waste now so apparent in the planning of school buildings. It will result in the same form of economy that now comes from the use of the budget system in financial undertakings. With such a rule, guess work, uncertainty, worry and loss of time in laying out the requirements of the floor plan are eliminated and the designer, given his problem, may at once

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proceed on a sure footing, for he will know from the start the exact requirements which he will be called upon to meet.

A six months' study of this problem and the trial and elimination of numerous methods in the practical work of the architect's office, gradually produced a certainty that facts obtained by the following rule were the basis upon which to plan.

SUGGESTED METHOD OF COMPUTATION FOR SIZE OF SCHOOL BUILDINGS.

Compute the probable maximum number of pupils in each grade for which the building is to be planned. Each study and special activity for each grade, with their period allotment per week, is to be worked out by the superintendent. Determine the maximum number of pupils that would probably take each study and special activity. The maximum number of pupils taking a subject is multiplied by the number of periods per week allotted to that subject. This product is divided by the average number of pupils in a group or class in that subject. This is divided by the number of periods in which a room can be used in a week.

In the last computation any fraction is counted as a whole number.

The result is then charted for use of rooms. First is shown each room with its distinctive purpose, then any supplementary or duplicate use that might be made of the room, then the home room pupil accommodation, and then the teacher use of the room.

Charting the school, first by special activities and studies and then by rooms and their possible multiple use, shows what margin for flexibility will be required in determining the final number of class and study rooms.

Notes from London

By Special Correspondent of THE AMERICAN ARCHITECT

THE conclusions recently arrived at by the City of London Churches Commission, and expressed in their report, recommending the removal of nineteen churches and the sale of their sites have aroused a storm of indignant protest in this country. Even in signing the report Lord Hugh Cecil added a note, in which he said, "I must add that I think the removal of a church and the desecration of its site a great evil"; and the offer in the report itself that "wherever the tower is worth keeping we have recommended that it should be kept" does not by any means satisfy public opinion.

The Lord Mayor has stated that he is not in favor of demolition of some of the nineteen churches on the list for destruction, and mentioned particularly St. Mary Woolnoth as one which should be spared, adding the wise suggestion that a special committee of archaeologists and experts should be appointed to inspect the churches, and report before the matter were definitely decided and Sir Banister Fletcher F. R. I. B. A., the well-known architectural historian, said that the city churches form an architectural heirloom of which any city might be proud, and any attempt such as was being now tried to destroy or remove them should be resisted to the utmost. Mr. Frederick Hiorns, writing yesterday in "The Observer," says: "Such contemplated vandalism is almost past belief . . . . Of the original fifty churches which Wren built eighteen have already suffered destruction, making it the more desirable to retain the thirty-two that remain. Yet we are to understand that thirteen more of Wren's structures are now threatened, and they include examples of such beauty and interest as St. Vedast, St. Magnus, All Hallows-Lombart street, St. Anne and St. Agnes, and St. Mary-at-Hill (the last two with most original and beautiful interiors), while of the churches of Wren's successors we are warned that a work of the exceptional merit of Hawksmmor's St. Mary Woolnoth may, after long hesitation, be swept away . . . . The financial needs of the Church, even when supported by demonstration of the "superfluity" of this or that of its buildings, cannot here be the final word; and there is here a strong case for considering primarily the spiritual as opposed to the financial and materialistic aspect of buildings which embody fine architecture."

Another suggestion offered is that these churches should be "carefully taken down and re-erected complete in suburbs that needs churches." Among the notable Wren churches which are now threatened are those of St. Anne and St. Agnes, with its garden upon Gresham St., St. Nicholas Cole Abbey, which has been called "a jewel like example of Wren's conception of a preaching-house," and St. Vedast, whose walls withstood the great fire and are partly recased, and which possesses a notable steeple enclosing a clock whose mechanism is com-

plete, but which has no dial face. One humorist remarks of the commissioners, "How such valuable sites as those occupied by the Abbey at Westminster and the Cathedrals of St. Paul and St. Saviour came to escape their attention it is remarkable, indeed, to conceive."

Architecture at the Royal Academy

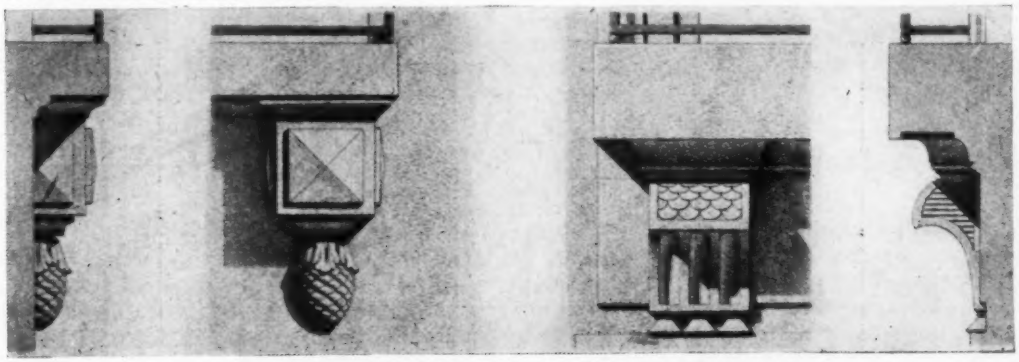
ON the whole this may be considered a very successful Royal Academy as far as architecture is concerned. There are noticeably few photographs of executed work, which is to be regretted, for in the case of some buildings these are most valuable; but their absence may be accounted for by the new regulation that photographs, which must not exceed half-plate size, are only admissible when exhibited in connection with working drawings and in the same frame.

Apart from this the work seemed to me good throughout, and the drawings in many cases excellent. This remark applies to Mr. Robert Atkinson's two well-handled drawings of "Entrance Hall to Theatre, Brighton" and "Proposed Theatre and Winter Garden at Liverpool"; to Mr. Raffles Davison's work "Stornoway Town Improvement" and elsewhere which is always good throughout, using pencil, brown ink and watercolor to get the effect needed; and to that fine water-color artist William Walcot's masterly drawing for Sir Edwin Lutyens' "Jaipur Column," which has, skilfully combined with Renaissance elements just the note of the East which is needed for the soil of India.

I imagine we may trace the same artist's hand in the drawing of the Imperial Ballroom (interior) at Delhi from Sir E. Lutyens' design; and coming to domestic architecture we can have nothing but praise for Mr. Ernest Newton's "Flint House, Goring" (entrance front and garden front) and "House at Kingswood, Garden Front," which are typical of this architect in house design. I admired also his "Memorial Shrine for Uppingham School." The group of buildings at Whiteley Village, Burhill, Surrey by Sir Aston Webb, P. R. A. and Mr. Maurice Webb are to be noted; and I liked particularly, for general composition and detail of work the "Elevation of the London County Westminster and Parr's Bank, Antwerp Branch," exhibited by Messrs Mewes and Davis. To be compared with this is Mr. Curtis Green's "Reconstruction of Nos. 258-260, Piccadilly," in Renaissance composition. But yet more important, in London street architecture, is the "Model of East Pavilion: south side of the Quadrant," in which Sir Aston Webb, Sir Reginald Blomfield and Mr. Ernst Newton have collaborated, the problem being, as I imagine, to combine harmony with existing buildings on this important West End centre with the legitimate requirements as to frontage of shopholders.

War Memorials are, of course, still well to the front in this academy; and I should select for notice the "Harrow School War Memorial" by Herbert Baker F. R. I. B. A., the "Proposed War Memorial Hall at Lambeth" by H. Austen Hall, though I do not care so much for Frederick Wilson's "Memorial Church." Very noticeable among memorial schemes is the perspective view of the Egyptian Expeditionary Force Memorial at Jerusalem by W. Palmer Jones, shown also here in a large-scale model, in which Greek and Egyptian elements have been blended into the design, which is boldly conceived but somewhat overweighted by the towering centre-piece. A very pleasing design for domestic architecture is Mr. H. S. goodhart-Rendel's "Cottages and Village Shop on an Estate in Hertfordshire"; and with these last may be compared the "Group of Cottages at Turner's Hill Sussex, exhibited by Sir Aston Webb, P. R. A. and Mr. Maurice Webb.

(From The Architectural Journal)



SMALL CONSOLES FROM A PARIS BUILDING (LOUIS XVI)

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Proposals for Housing Relief in New York

Plan Suggested by Labor Party

Labor must be given a responsible part in any successful housing programme, states Frank E. Hill in the New York *Globe*.

Participation by labor becomes possible with the extension of state loans for housing and the creation of state housing boards.

These boards should contain definite labor representation, and should encourage the formation of non-profit-making societies of architects, builders and workers which could employ state funds for furnishing houses to the laboring classes.

These are the conclusions of certain labor specialists, architects and workmen. They have just been adopted at Schenectady by the American Labor Party. They are believed by Ordway Tead of the Bureau of Industrial Research, a member of the committee of experts which drafted a plan at the request of the American Labor Party, to offer remarkable promise for a solution of labor difficulties in connection with present day construction. According to many who meet labor in a practical way in the building field, such a plan has a promise of success.

It is generally admitted that the present labor situation is unsatisfactory. Wages are high. In many cases the men insist on a ten-hour day with two hours paid at overtime rates. Labor of all kinds is scarce, and skilled labor is scarest of all. It has gone into the factories and into transportation service where brawn can command high rates at loading and unloading. That disagreements and strikes frequently interrupt building operations is the general testimony of both speculative builders and architects, and even when work is done it is often not as efficient work as was performed ten years ago.

The plan of the American Labor Party, in Mr. Tead's opinion, will strike at all of these evils.

"One of the great difficulties," he declared, "is as usual a psychological difficulty.

Relief as Proposed by Mayor's Committee

The Mayor's Committee on Housing is working valiantly to stimulate the building of apartments and it is accomplishing a partial relief. It is, for instance, securing pledges of loans on second mortgages; it has secured the promise of a thousand building lots on terms by which the first mortgage shall cover the cost of the ground and no initial payment shall be required from home builders who purchase them, and it is trying to induce employers to join a building association which shall co-operate with various loaning organizations so that their employes may be able to build homes for themselves on the credit of their characters and their jobs.

All these are excellent steps so far as they go and are especially excellent in that they stimulate men to own their own homes and to pay for them out of their savings. But if all the reliable and permanent workers who could be induced to make this home building venture were to be housed upon suburban lots under conditions of long and easy credit, the pressure for apartments in the more central sections would be reduced but little. New York is so far behind in its building program that nothing but a very large investment—the committee figures it at $560,000,000—will meet the need.

Banks and insurance companies are lending less money on building mortgages than they would do if they could get the same returns for their capital as they can in other lines. Building mortgages yield small returns because of the Federal and State income taxes, and this results in building congestion, not only in New York but quite generally throughout the country. To remove that obstacle the committee urges that the income from such mortgages be exempted by Congress from the payment of income taxes.

The representatives of several insurance companies said that their companies were lending on building in preference to more profitable forms of security because the housing situation here is so grave as to require emergency relief, but, of course, such a course cannot be depended upon. Unless building loans can compete with other forms of investment, building will be squeezed down to the lowest limits. The exemption of such loans from the Federal income tax is the obvious means of making them attractive. The Government can better afford to lose the income derived from that source than it can to encourage housing conditions which congest population to the danger of health and which prevent the revival of business activity in building materials.

A Correction

We are in receipt of a letter from Mr. T. MacLaren, of Colorado Spring, in which he states:

"In your issue of April 21, 1920, appear illustrations of Durango High Scool, Colorado, credited in error to Charles E. Thomas, architect, instead of the former firm of MacLaren and Thomas."

Current News

Happenings and Comments in the Field of Architecture and the Allied Arts

Pittsburgh Plans High Building as War Memorial

The world's tallest building is being planned by Pittsburgh citizens as a memorial for Pennsylvanians in the war, according to an announcement by the bureau of memorial buildings of the War Camp Community Service. The tower is expected to reach an altitude of 2,100 feet, high above the smoke screen of the city, and will be almost three times the height of the Woolworth Building and seven times as high as the Flatiron Building.

On the 2,000-foot level an observation tower will give a view of 40 miles radius, and vari-colored electric searchlights will radiate in various points of the compass. An assembly hall to accommodate 15,000 persons will occupy the second story, which will exceed by 5,000 the proposed capacity of Victory Hall in Pershing Square, New York. A restaurant will occupy the floor at the 1,000-foot level, which will offer a wide view of the city. A memorial room, situated 500 feet above this, will be large enough to house any instrument used by the army in the war.

Lumber Tragedy of the United States

1. The New England states are no longer self-supporting in a lumber way.

2. The Lake States, once our greatest producers of lumber, are now importing lumber to keep alive the many wood using industries in that section.

3. The center of the lumber industry is fast moving to the Pacific Coast, which means long hauls and high freight rates.

4. The lumber people of the Southern States admit they are through in fifteen or twenty years, as far as yellow pine is concerned.

5. The forest fire loss in this country is about $28,000,000 every year, and the area burned over is ten times greater every year than the devastated areas of France we have heard so much about. This must stop.—U. S. Agricultural Department.

Building Industries Ask Recognition in Car Service

Following the petition of the carriers to the Interstate Commerce Commission to invoke its executive powers to relieve the nation-wide freight congestion, the National Federation of Construction Industries has addressed a request to the commission asking that recognition be given the various branches of the construction industry in such orders for car service as might be issued by the commission. The closing paragraph of the builders' petition follow:

"The railroads are dependent upon the construction industry for the material wherewith to maintain their roadbeds. Highways, bridges, agricultural, industrial and other structures are products of this industry. Approximately fifty per cent. of the cement produced in this country, and large quantities of hollow tile, brick, lumber, lime, crushed stone, sand and gravel and other materials supplied by the industry are consumed by the farmers of the United States, mainly in the improvement and enlargement of their productive units.

"The attention of the commission is respectfully called to the fact that the uses to which construction materials are usually put are essential to the welfare of the general public; and that the degree of essentiality of any material in an emergency such as is now reported to exist should be determined by the consideration of the purpose to which it is put.

"*Wherefore,* having called the earnest attention of the commission to the essential character of the construction industry, and having set forth all the matters hereinbefore mentioned, and now assuring the commission of its willingness to furnish to the commission upon request any additional facts which it may have in its possession or may be able to obtain, your petitioner prays that in the effective exercise of the powers and duties cast upon the commission by law in emergencies such as are reported now to exist, the commission will recognize the essential character of the service being rendered by the construction industry and save the same harmless in this emergency.

XUM

Sound-proof and Sight-proof

A western paper looks into the future and states that with the invention of the geophone the world will have to be made sound-proof.

The device enables the human voice to be heard through fifty feet of solid coal and the voice has been detected one hundred and fifty feet away through less solid substances. It would seem that the dictagraph will be supplanted. Anybody can place a geophone and no one be the wiser. This paper says in part, "A law may have to be devised to forbid its use because it can be turned to any number of improper and even very embarrassing employments. Applied to the walls of a room it would give facility to hear anything said in an adjoining room. Fancy the United States Senate in secret session, regarding which it is very sensitive. It would be easy to apply the instrument and listen to all the learned senators might have to say. One would not be dependent upon some senator who took notes on his cuffs for translation outside.

"It would seem that conferences involving secrecy might be compelled to devise new means of conduct. Such conferences may have to employ writing for communication between the individuals."

It is today permitted to observe as far as the eye can see. Why not leave unrestricted the hearing facility. If people conduct themselves as they should, there need be no embarrassment. Character has been defined as "what you are in the dark." If we need the lights turned on to keep at the level of our best moments, why, let us have the geophone to help us.

War Department to Send Motor Convoy from Washington to Los Angeles

Plans have been completed whereby the War Department will send a motor convoy from Washington to Los Angeles over the Bankhead National Highway on or about June 15, due to arrive at Los Angeles September 1.

The purpose of this and other overland trips will be to study the handicaps which surround the transportation needs of the army on account of the lack of dependable and definite systems of highways; to secure data relative to the use of various types of motor vehicles; to secure relative data on solid and pneumatic tires; to train officers and men en extended field operations, and to recruit personnel for the various branches of the army.

The Federal Highway Council feels that such study by the Motor Transport Corps will be of great value to the entire country, because it will thoroughly establish the necessity of the Federal Government undertaking the construction and maintenance of a definite system of national highways.

The convoy will be under the supervision of the Motor Transport Corps and will consist of a motor transport unit complete, at war strength, one service park unit, at war strength, detachment from Engineers Corps, and detachment from Medical Corps. All motor trucks will be one and one-half tons capacity equipped with pneumatic tires.

The tour will start from Washington passing through the following states: Virginia, North and South Carolina, Georgia, Alabama, Mississippi, Tennessee, Arkansas, Texas, New Mexico, Arizona and California, ending at Los Angeles.

State Aid for Cheap French Dwellings

The French law of April 12, 1906, amended Dec. 23, 1912, relative to state loans to enterprises engaged in the building of cheap dwellings has been further amended so as to provide for multiple dwellings, or apartment houses. The principal provisions of the amendment according to a recent issue of the Monthly Labor Review issued by the Bureau of Labor Statistics, U. S. Department of Labor, allow certain state aid on multiple dwellings when the annual rent of each apartment does not exceed at the time of construction a maximum of 300 francs per year for three rooms and toilet containing a total floor area of from 376.7 to 484.4 sq. ft., for communes having a population of 5,000 and under; to 720 francs per year for the city of Paris for the same number of rooms, with the same approximate floor area. For more than 484.4 sq. ft. of floor space the maximum annual rental is fixed at 325 francs for communes of 5,000 population and under to 760 francs to the city of Paris and the Province of the Seine. The law also applies to construction of apartments containing two rooms with kitchen and toilet, one room with kitchen, and one isolated sleeping room.

The annual rental of individual dwellings is fixed at 4 per cent. of the actual cost. The state may advance through the mortgage bank not more than 200,000,000 francs and the Bank of Deposit and Consignation (under government supervision) is authorized to advance not more than 300,000,000 francs for such enterprises.

Loans are to draw 2 per cent. interest annually if used in the acquisition or construction of individual cheap dwellings, or in the acquisition of small properties, under the provisions of the law of April 12, 1906, that of April 10, 1908, and subsequent laws. If used for the acquisition or construction of cheap dwellings or small properties for

rent only, the rate of interest is 2½ per cent. Provision is made for loans for completing dwellings now under construction.

Arc de Triomphe Scoured

The world famous Arc de Triomphe, which is perhaps the dominating symbol of the French capital in the minds of many foreigners, became the subject of a heated controversy between a Paris newspaper, the *Intransigeant,* and the local government authorities. According to the report in the Philadelphia *Ledger,* it appears that the French peace loan posters, which were issued in innumerable variety, had been plastered through the length and breadth of the capital, but only were stuck on government buildings, banks and such places as permission was not necessary to ask. The bill poster men did a thorough job. They plastered the walls of the Louvre, the colonnades of the Rue de Rivoli, church walls, palaces and monuments, and the handsome arch was literally covered with posters over the ones already stuck up.

The arch was a cubist-furturist delight in a dazzling array of colors. Its camouflaging was so complete that long after the loan passed the posters remained ragged, dog-eared, torn and weather beaten. The newspaper protested with photographic eloquence and editorial invective, the public, too, felt the shock to their æsthetic sense, but the government remained impassive. After due warning, the newspaper hired a wagon and a gang of laborers, armed them with ladders, sponges, scrappers, hot water and soap and, while puzzled gendarmes looked on, the premiere toilette of the arch was performed. A load of rubbish was scraped off and the monument emerged from its chrysalis of rags and tatters with all the architectural beauty and dignity that its name suggests.

How New Zealand is Getting Homes

Most of the other countries affected like the United States, by a shortage of houses, have established some system of governmental aid for those who want to own their own homes. One of the most interesting arrangements is that of New Zealand.

The housing act passed last year provides a national board, in charge of a fund for helping anyone who meets the conditions set down. The measure is intended to help only those of comparatively small incomes. No citizen whose income exceeds $1,525 a year is eligible, and the limit is lower for small families. The price of the house, too, is limited; a wooden house may not cost more than $3,750, and a brick or stone house not more than $4,250.

The dwellings are built by the government, and the buyer obtains possession by paying only $50 down and guaranteeing to pay the rest in installments over a period of 25½ years to 36½ years. With each installment he pays the interest, at 5½ per cent., due on the balance outstanding at the time. He may pay off at any time as much of the principal as he pleases, and in case of defaulted payments he receives back whatever he has paid, less a stated allowance for depreciation of the property during his occupation. He also pays the insurance charges.

Some extremely conservative folk migh[illegible] this "socialism." It is at least an extrem[illegible] of national "paternalism." Nevertheless such a plan does not look half so radical as it would have looked before the war. Some of the conditions would obviously not be suitable for the United States; the price limits, for example, are too low, and perhaps the time allowed for payment is unnecessarily long. These, however, are more or less accidental details. The point is that here is a definite plan whereby the entire community is helping its homeless members to obtain homes, on terms fair to both parties, and that it is considered in almost every civilized country a legitimate and commendable public enterprise.

It matters little whether the enterprise be conducted by the nation or state or city, so long as it is in responsible hands. A writer in the Lansing, Mich., daily press believes that Americans might profitably follow the example.

Yellow Light Best

Illuminating engineers some months ago made a series of tests with incandescent electric lamps, gas, gas mantles graded for color, and oil lapms, the candlepower being the same in each case. The larger the number of yellow rays in the light, it was found, the greater the optical efficiency. Blue rays were found to be conducive to earlier fatigue of the eyes. Thus, it appears, that the general preference for light of a yellowish cast is not the result of mere whim or habit, but of the eyes' recognition of the fact that such a light is less tiring.

Our Outworn Community Systems

The world is coming to realize that our whole theory of community building will be made over. Old communities are struggling in the throes of congestion of all kinds and yet there are not enough houses or recreation places or schools or buildings of all types in these centers.

XUM

What will be the streets of the future? Will street level sidewalks disappear in our cities? What is to become of pedestrians? Where shall we park the comming 50,000,000 automobiles by day? Where will they be stored by night? Where will the hundreds of airplanes land. And for the countryside, what of our national highways.

What is the answer? The Seattle *Daily Journal* justly states that it is science. Science which is the business of knowing what to do. The whole civilized world wants to know what to do with its outworn community systems. It is groping for the answer and only groping. London is planning a new city of a quarter million to take care of its human overflow. A new paved highway 100 feet wide it to be built between Edinburgh and London. England would seem to be feeling the urge for the new order of things first and is groping—but only groping.

The restless fever of men, in all callings, will no longer be abated by the old prescriptions. Men are seeking more of a chance to live—for themselves and their families.

But living involves communities, giving comfort and convenience and full of life, variety and color in a broader sense.

We used to think that people lived in houses. It was our great mistake in building communities. People dwell in houses but living is another matter. It involves life, contacts with other lives, the spirit of play, recreation and work, of festival and pageant, of music, decoration, schools, theatres, gardens, woods, streams—and grass that does not warn us to keep off.

Fire Prevention in Public Schools

The study of fire prevention has been added to the curriculum of the New York public schools by the Board of Education. The board has adopted as a basis for regular study the school manual entitled "Safeguarding the Home Against Fire" prepared for the United States Bureau of Education by the National Board of Fire Underwriters.

Emphasis will be laid in the instruction upon the fact that a fire occurs in New York City on an average of every twenty-one minutes, day and night, with "most of these due to carelessness, according to engineering experts." Many of the fires occur in homes and so many are attended by injury or loss of life that it has been estimated that about 100 persons are burned to death in Greater New York each year and many more seriously injured.

Making this study compulsory is following the example of many other communities. Kentucky has had a statute for some time making the study of fire prevention compulsory and the last New Jersey legislature passed a law providing for this study in September. In Minnesota it is also planned that pupils and teachers should study the subject before the close of the school year.

Louvre Extends Appeal to Art Lovers

Artists and the art lovers of Paris, as well as the American tourists, are much interested in the opening of the Grand Gallery of the Louvre Museum, which, with the Chauchard and the Schlichting collections, comprise the most admirable offerings found in any national museum. The square salons have been entirely remodelled, while the new arrangement of the gallery is said to effect a greater range of lighting interpretation than ever was before possible.

The parts to be reopened offer principally the works of Rembrandt and Rubens and those of their schools, with Dutch and Flemish subjects. In the Rubens salon nothing has been changed. Rembrandt's grandeur and profound expression are found expression are found especially in the series containing "La Bethsabee," "Saint Luke," the "Good Samaritan," the "Two Philosophers," the "Disciples of Emmaus" and several portraits.

M. Arsene Alexandre, the leading French art critic, considers this the most wonderful collection in the world and he only regrets that Paris has not yet obtained "The Syndics and the Ronde de Jour" from Amsterdam, which would give fuller scope to the realization of what the Rembrandt school intended to convey.

The smaller salons are being redecorated, maintaining throughout the high sense of artisticity which always characterized the Louvre arrangements, especially as far as the art section is concerned. These salons later will be used to house the Chauchard and Schlichting collections which have been lost in comparative darkness, in the drearier corners of the Salle Lacaze.

But while the Louvre makes a constant appeal to the trained art lover, it is now intended to inaugurate a series of lectures, commencing next November for the benefit of the academic pupils. Twelve sections are being formed, each one to be guided by an authority who is familiar with the artistic and historical relics of his particular section. In the past, teachers of art frequently have conducted brief courses of study in the Louvre, but this is the first time that an effort is made to employ the national institution for public instruction, similar to the practice prevailing in the American museums of art and natural history.

It may be that some complaint will be made that

the chattering of the young students will disturb the serious reflections of the older visitors to the galleries, but in official circles praise is given to the author of the innovation, which, it is asserted, will have a widespread effect on the future welfare of the French nation in the sense that even the ordinary individuals will begin to appreciate what a wealth of art remains for their admiration.

Communal Forests Planned to Solve Up-State Tax Problems

The Northern New York Development League, a regional Chamber of Commerce, including all the varied interests of the northern third of the state, has decided to actively undertake and sponsor a reforestation program whereby it is hoped that it will impress upon the public not only the value of the forests in industrial lines, but in the deriving of revenues from the forest which has proved successful in the reducing of taxation in many parts of Europe.

The fundamental principle of the league's campaign is the communal or public forest, which does not mean that it will be less active for private or corporation reforestation. It stands first for the public idea because the private idea will thereby be given encouragement and private effort will then have a constant example of public accomplishment along the same lines.

One of the best known examples of a communal forest, cited by the New York *Times,* is that of Zurich, Switzerland, which city controls 2,840 acres of land, of which the city uses the forest mainly for fuel wood which furnishes 64 per cent. of the income from the forest. Lumber, ties and miscellaneous materials make up the balance of the revenue. There is one technical man in charge of the forest, which has netted the municipality an average income of nearly $20,000 annually.

The state laws now provide full authority for communal forests. Chapter 74 of the Laws of New York, General Municipality, which became effective on March 26, 1912, allows the governing board of a county, town or village to acquire by purchase, gift, lease or condemnation and hold as the property of such municipality, such tracts of land, and may appropriate therefor the necessary moneys of the county, town or village for which lands are acquired. The procedure is by resolution of such board, after having published notice two weeks in the newspapers prior to such action. The lands acquired for public forests may be located outside of the municipality and may be located in separate parcels of land, if desired. Part or all the municipal forest may be located around the water supply of the municipality to protect and to perpetuate the future supply of water.

Many communities have already started small forests for this purpose, but the real communal forest is one that provides public revenues. These forests by law can be cut off along the lines of scientific forest management and the timber sold in the interest of public revenues. Not only do they offer a perpetual income to the taxpayers of the community, but also the advantage of forest cover which means the protection from floods, snow slides, earth slides, the regulation and the preservation of the water of streams, shelter from winds, protection of birds, fish and game, and healthful playgrounds for the young and old.

Little or nothing has been done under this law and it is proposed to have the North Country take the leading place in this kind of work and set an example to the rest of the nation. Northern New York has had a leading place in private reforesting and some of the best individual and corporation planting programs have been carried out here.

Many of our large interests are practising scientific forestry by cutting down only certain sizes and varieties of trees and are contributing their share in the reforestation movement. A very large fraction of the land in Northern New York is not suited to farming purposes but is excellent for reforesting. These lands are well adapted to become communal forests, which will substantially decrease taxes and thereby keep up the roads and contribute generally to public improvements.

The State Conservation Commission offers effective assistance in furnishing trees of many varieties at low cost. The league has been working on the proposed free-tree law and there is every expectation of success in the near future. Whether we have this law or not the present cost of trees is so reasonable that any one can afford to reforest to some extent. The College of Forestry is cooperating in this work and offers practical assistance to the municipalities and to the northern section in mapping out local programs and in superintending the setting out of trees.

United States To Sell Housing Land

The United States housing corporation tract of 376 acres in East Bethlehem, known as Pembroke village, which cost the government about $2,800,000 before the armistice, which amount included $376,000 paid by the corporation to the Bethlehem Steel Co., former owner, will be sold through the housing corporation of Bethlehem.

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Army Houses To Be Sold

Washington, District of Columbia.—Sale of public auction of 690 buildings at Camp Dodge, Iowa, has been authorized by the War Department as a means of relieving the housing situation at Des Moines, Iowa. These buildings were put up to house army squads of eight men each, and are said to be available for family use. It is expected that they will help materially to improve conditions in Des Moines.

Timber in New England

The output of lumber in the next decade in Maine, Vermont and New Hampshire will be greatly reduced because of the heavy inroads on the timber made by the pulp and paper industry. The paper manufacturers are making an effort to get all available pulp stock before it is necessary to abandon their plants. The result is that much of the timber that would otherwise be cut into lumber has been made into wood pulp. If it were not for the pulp and paper interests, the New England states, say a recent investigator of timber conditions, could keep up their present rate of lumber production for a long period. It is estimated that the production in Maine will shrink a quarter of a billion feet in the next ten years, although it has been said that Maine would hold her own from now on. The same situation prevails in a proportionate degree in Vermont and New Hampshire.

The Forest Service has been investigating production, timber stand, etc., in these New England states this spring in preparation for the report required by the Senate under the Capper Resolution.

Personal

George W. Maher announces the removal of his office from 208 South LaSalle St., Chicago, to his building, 157 East Erie St., Chicago.

Stork & Knappe, school architects, have moved from Palisade, N. J., to King St., Ardsley, N. Y.

A. Kingsley Porter, known to readers of this paper as an authority on mediaeval architecture, and author of numerous articles on that topic published in The American Architect, has resigned as assistant professor of the history of art at Yale to accept an appointment as professor of fine arts at Harvard.

Frank A. Spangenberg, architect, and Earl Martin, associate, have moved from 160 Franklin street, to 1322 Prudential Bldg., Buffalo, N. Y.

Joseph Impellitier, architect, formerly of 280 Prospect avenue, announces removal of his offices to 156 Elmwood avenue, Buffalo, N. Y.

Nathaniel Koenigsberg and Louis I. Simon announce their association as architects and engineers at 8 South Dearborn street, Chicago.

Westinghouse, Church & Kerr have moved their offices from 37 Wall street, to Grand Central Palace, New York City.

Sanford O. Lacey and Gerald G. Schenck announce that George Bain Cummings, formerly of New York, has been admitted to partnership. The new firm will continue architectural practice at 514-6 Phelps Building, Binghamton, N. Y.

George R. Morris and the Apartment Corporation have moved to the Morris Building, Charles and Saratoga streets, Baltimore, Md.

Wm. T. Braun has formed a partnership with Edward A. Nitsche and will continue the practice of architecture at Steinway Hall, 64 East Van Buren street, Chicago.

Warren W. Day has formed a partnership with Clark Wesley Bullard of Champaign, Ill. A general practice of architecture will be conducted under the name of Day & Bullard at 527 Main street, Peoria, Ill.

A partnership for the practice of architecture and engineering has been formed between Clarence H. Larsen and John Glenn Mason, both of Lincoln, Neb., with offices at 408 Terminal Building.

George M. Hopkinson and Wellington J. Schaefer have formed a partnership with offices at 5716 Euclid avenue, Cleveland, O. Samples and catalogues are desired.

H. H. Whiteley, Los Angeles, Cal., formerly at 429 Story Building, is opening new offices at "La Cabana Azul" 520 South Western avenue. He desires samples and catalogues.

George S. McCrea, architect in the Pacific Building, Oakland, has moved to Capitola, Cal.

Charles W. Deusner and Miss Helen Dupuy Deusner announce that they have resumed the practice of landscape architecture in Southern California, under the firm name of C. W. and H. D. Deusner, with an office at 15 North Euclid avenue, Pasadena, Cal.

Edgar W. Maybury, of Pomona, Cal., has established offices at 125 West Monroe street, Phoenix, Ariz., as representative of Messrs. Reginald D. Johnson, architect, and Gordon B. Kaufman, associate, of Pasadena. He desires catalogues and building samples from the trade.

Weekly Review of Construction Field

With Reports of Special Correspondents in Prominent Regional Centers

"Firm Minus Pint of Oil or Foot of Land Sold $20,000,000 Stock." So it goes according to a headline in a New York daily.

We don't know where this $20,000,000 came from but it is safe to suppose it is cheerfully offered by the dear public.

We don't know why people prefer to put up their money for the perpetuation of a get-rich dream rather than for something they need, but we hazard a guess that they rather spend their thoughts and money for the imagination of a vain thing—than for a house and lot.

It seems fair to suppose that this money came into New York—not from those who have both town and country houses, but from those who want to have them. There is a continual multiplication of the type which imagines an ambuscade against work and looks for quickly made money to build such a bulwark.

What folly it is to discuss means of relieving the financial stringency which has been brought about by goods held in transit, by low returns on mortgages and other building investments, by general unsettlement and uncertainty as to the future—when the people of this country are so gullible as to listen to the claptrap of promoters; or rather, not to listen to it but to interrupt a fantastic story by coughing up $20,000,000 into their faces.

So many little communities there are, where the worn out farms are now called upon to gush forth wealth upon the inhabitants. The hopeful owners sit before their weather-beaten doorways and expectorate. So many brokers' offices all over the country are handling the surplus of wages of the common every-day people whose minds have newly evolved the old hope of acquiring, without work, money, leisure, and everything their heart desires.

Idealistic America: probably it will always be that. But idealism sometimes goes wrong. When it aims at a new heaven upon earth which shall be a place without work and cheered perhaps by twanging harps and jazz bands; the entrance fees to be paid by stock exchange profits or by the edict of some new social system: then do we succeed in perverting our noblest quality.

On the day this item appeared on the front page, the same paper's financial column announced that capital before giving permission for its money to be used in safe and legitimate enterprises was demanding interest of eight per cent., that during the afternoon its demand increased to fourteen per cent.

And the people give it away.

(By Special Correspondence to The American Architect.)

Chicago.—Strikes, higher wages, lack of transportation, higher building costs, increased money rates, checked construction! When will the situation change for the better? When will common sense return, production rise to normal and profiteering and extravagance cease? Well, anyway—

Overtures made recently to the employers by representatives of the Chicago building crafts, urging resumption of normal building activities, and promising increased output as a part solution of the high building costs, indicate that labor is beginning partly to realize its responsibility in the decline of constructon work here which has amounted to approximately $100,000,000 since the first of the year.

Though many of the craft lay the slump in individual production to the cost-plus system, with its opportunities to pile on labor costs and thus increase the percentage to the contractor, the average man on the job is willing to acknowledge he has about "killed the goose that lays the golden egg." Following restricted output come high wages and less work —and the fact is driven home.

Carpenters, bricklayers, plumbers and the rest of the trades are facing a slack season, unless something happens. This is accounted for in the slackening in building activities and the influx of workmen from other points attracted by the higher wage scale. Competition for work has stimulated the output. Builders report the attitude of labor has changed within the last month and an increase of from 15 to 20 per cent. in man hour output is noted. It is apparent that the men realize they will have to speed up if they want to keep their jobs.

There also has been a change in the building material market, to some extent. Where formerly it was the builder who was frantically bidding for supplies, now it is the brickyards, the cement works and the manufacturerers who are anxiously inquiring why orders are not coming in in larger volume. While transportation conditions are a little better and building supplies somewhat easier to get in some lines, owing to restrictions placed on less essential industries, prices on building materials are still abnormally high. Builders do not look for any big increase in construction activities until there is a decided drop in building costs. Building permits this week totalled 36, valued at $2,148,000 as compared with 125 permits and $3,603,300 for the corresponding week last year.

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(By Special Correspondence to The American Architect.)

San Francisco.—There seems little doubt that San Francisco is on the verge of greatly increased building activity, and local architects are busy with plans for new structures which will undoubtedly be undertaken in the very near future. Speaking on this conditions, R. W. Kline, head of the construction department of Willis Polk & Co., says:

"Housing conditions have become acute, apartments are overcrowded and the same applies to office buildings. With office and business structures occupied 100 per cent.—plus, there is a general demand among business firms for room to expand, and none is now available. New rental standards have been generally adopted showing an increase of 30 to 40 per cent. While the costs of building have gone up these new standards permit construction on a profitable basis. This means that in the very near future building will become heavy. At the present time we are about three years behind in our building program; there has been much emergency work, and there is much to be done; but a great wave of new building is now due, and the industry will, almost before we know it, be one of the most important activities in the city."

A local banker of prominence gave the following advice this week to a prospective home builder: "When you build a home you should locate in a district where the homes surrounding yours are as good or better than your own. Such conditions make your property more valuable and more readily saleable if you ever have to dispose of the place. You should chose a lot that has some particular individuality not to be found in any other lot in San Francisco and then plan your home to conform to the lot."

(By Special Correspondence to The American Architect)

Seattle.—North Coast jobbers are able to report an improvement in the delivery of steel building products from the East and although three cars of nails to one house in a week is under normal conditions but a circumstance, it so far overshadows what has been the course of deliveries during the past ninety days that the trade is greatly encouraged. In addition, sheet metal is being released to a marked degree. There is no improvement in the condition of delivery of steel pipe, especially the smaller sizes necessary in plumbing and heating. The markets on all steel products are steady.

The car shortage and its train of evils in the disturbance of business credits and profits may be relieved through the Jones bill before the United States Senate which would permit the Steel Corporation to operate coastwise ships from the Atlantic seaboard through the Panama Canal under the name of the Isthmian Steamship Company. This line has notified jobbers that it expects to make the trip in 26 days and will undertake to guarantee to cover the distance between New York and Puget Sound in 30 days. Sailings are to be spaced ten days apart. But this new transportation is not expected to aid the delivery of the smaller pipe and essentials to any marked degree owing to the fact that the mills are not turning the material out. It would, however, closely approach a miracle in the delivery of structural steel and sheet metal stock. All the North Coast jobbing interests favored the Jones bill.

Building projects have eased off, and the outlook today is that work under way will be completed at as early a date as possible, but there will be no new large commitments this summer. Jobbers of pipe, fabricated steel, brick, cement, roofing and lumber are almost a unit in the expression that they have no hope for a beneficial improvement during future months.

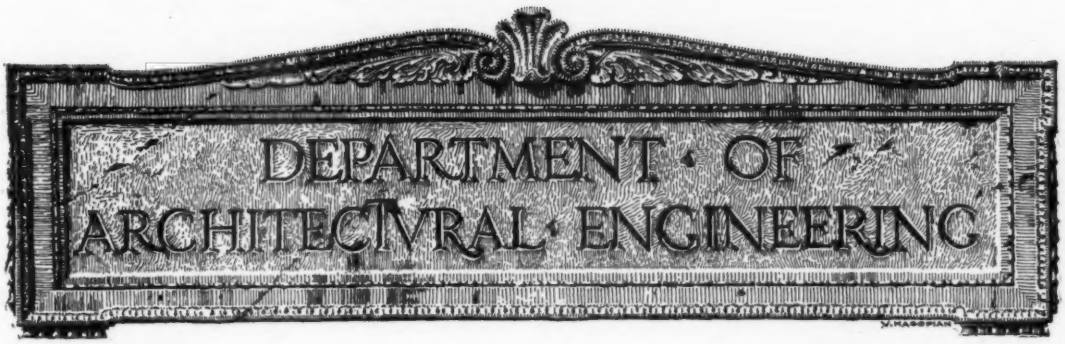
Jobbers this week picked up the first lot of channel iron that has been seen here for 90 days.

The demand in Alaska for minor building essentials is very brisk, and this trade is helping materially to keep Seattle architects at work on the smaller jobs and it also makes for the movement of brick, cement, lumber and roofing into the North.

Fir lumber held steady for the week after the slump a week ago of $3 to $5, and it is almost universally felt, in unprejudiced sources that builders will not be able to buy fir lumber any cheaper this year. Common dimension is selling at $1.50 under the bare cost of the logs. The mills are closing down for the annual overhauling, and the duration of the suspension may reach sixty days. Logging camps are to be shut down on account of the fire hazard, and production will fall rapidly during July. The mills are not expecting to make any further price concessions, but reports from eastern builders indicate a dull Summer and a limited fir lumber movement eastward.

The paint and oil market is steady. Carload prices of lead f. o. b. Seattle have declined slighty. The weakness in the raw lead market in New York during the week was not reflected here. Paint jobbers predict a higher market for oils in the Autumn.

A diminution of the movement of paints corroborates the report from lumber and building material jobbers of an impending lull in the demand.



The Relation of the Work of the Forest Products Laboratory to Engineering*

By George M. Hunt

In Charge, Section of Wood Preservation, Forest Products Laboratory, Madison, Wisconsin.

IT is my intention to present something about the laboratory, what it is, and what it has that might interest you, so that when faced with a problem concerning the use of wood, the Forest Products Laboratory and its equipment will be at the disposal of the technical profession.

The Forest Products Laboratory is a branch of the United States Forest Service, which is a branch of the Department of Agriculture. The Forest Service has for its principal work the administration of the public forests, protecting them from fire, re-foresting burned over areas, protecting them from timber thieves, and regulating the grazing. The grazing feature alone on the National Forests for cattle, horses, sheep and hogs is a big business. It amounted to over two and one-half million dollars last year in grazing fees. The Forest Service also has, of course, the disposal of the timber that grows on the forest. When the timber is ready to be cut and when a market is available then obviously the thing to do is to sell it. If left standing, it deteriorates, and after a while there remains a forest which is half full of dead and decaying trees.

It would not be right to sell to the public this timber, letting them make what use of it they can, without giving them as much information as possible about what timber is and what are its peculiar properties, how different species vary from each other, and how wood may be most efficiently used in the various lines of work where it finds application. The need for technical data about wood was recognized a good many years before the laboratory was established, and efforts were made to collect information of this kind. For many years people have been interested in the study of wood. There has never been a concerted effort on an extensive scale to gather the technical data that is needed.

The field of forest products is a very broad one when studied carefully. It does not consist merely of strength tests on timber or of studying the chemical products that can be made from wood. There are unlimited fields for study and in order to attack the problem in the best possible way, the organization of the laboratory was grouped into a number of sections. We have the director and the assistant director in general charge of the work, then five technical sections.

The section of timber physics includes kiln drying. The importance of artificially seasoning timber became evident during the war when a stock of air dried timber was needed for making vehicles and artillery trucks, automobile trucks, propellers, airplanes, and the various other implements of war —and of peace also—where wood was required. Seasoned timber was not available. There was only one thing to do, and that was to cut down green trees and season them.

There had always been a prejudice against kiln dried timber. It has been said that when timber is kiln dried the strength is reduced, it breaks easy, and that it will spoil in a dozen other ways. They were correct in part. Unless the timber is properly dried it is injured, but the tests that have been going on for the last ten years, and especially those during the last two and a half years, have shown conclusively that timber can be kiln dried without injury. In fact, if the drying is properly done, the

*Abstract of an address before the Western Society of Engineers.

timber is likely to be a little bit better than it would be if air dried.

The time required by kiln drying, of course, will depend upon the size of the timber. If it is inch boards it can be dried much more quickly than four by four or six by six wagon stock; but whatever the size of the timber, it can be dried much more quickly in a kiln than by air seasoning.

Kiln drying work is being continued, because the demand for timber is, if anything, greater now than it was during the war, because of the demand of the furniture industry and various other industries which were partly closed down during the war, but are working full force now.

In the section of timber physics they also study the microscopic structure of timber. The microscope is a valuable instrument in the study of forest products and tells a great deal about timber that cannot be learned in any other way. It tells why it is easy to force wood preservative through a red oak stick when it cannot possibly be forced through a white oak stick. It tells the difference between a piece of pine and a piece of fir or a piece of spruce. By means of the microscope species of wood can be identified that cannot very well be identified in any other way, and since the properties of wood depend very largely upon the species, identification is often very important.

As an illustration of the practical use of the microscope I can cite one instance. A few years ago a railroad company was buying several carloads of oak ties. They ordered white oak. When the ties arrived the railroad men claimed they were red oak, while the tie contractor claimed they were white oak. Both parties secured samples of the ties in question and brought them to Madison. They were examined under the microscope and it was found that the shipment contained both white oak and red oak.

PERHAPS the section which would be most interesting to the bridge and structural section of this society is the section of timber mechanics. This is a section which studies the mechanical properties of timber, which attempts to find out why one timber is strong and another one is weak, which attempts to find the average strength of various species of timber.

One thing included in the study of mechanical properties is the relation of the strength of timber to its density. It has been conclusively shown that the strength of a stick of timber, other things being equal, is very largely dependent upon its specific gravity, its density, which means, to be exact, the amount of wood substance there. Wood is composed of woody material and air and the more woody material there is in a cubic foot of wood, the greater its density and the greater its strength. That is a general rule. There are exceptions to it, and slight variations from it. Ordinarily, a person is likely to think that the strength of oak is so much; the strength of pine is so much—that is the general impression. As a matter of fact, one can get pieces of oak that are much weaker than pieces of pine, and pieces of pine that are much weaker than other pieces of oak. It is easy to get pieces of pine which will have less than one-third of the strength of other pieces of the same species, and to the man uninformed, it is hard to tell the difference.

The need for some means of telling the difference has resulted in density grading rules for structural timbers. By means of these grading rules it is possible for a man with relatively little study to select the wood which has the required strength and thus eleminate the weak timbers. The relation of density to strength, of course, assumes that all other factors are equal, but of two sticks of equal density one may be spiral grained and the other straight grained. The spiral grained stick will be weaker.

A NEW development in timber construction which is receiving increased attention is the use of laminated members instead of solid members. As timber becomes more expensive and the larger pieces are harder to get, it is of greater advantage to be able to use smaller lumber and build it up into the sizes and shapes desired in structural members. In doing that, it is necessary to know the effect of various methods of fastening these laminations together; one must know the effect of defects. Can we put five 2-inch planks together to make a beam, allow defects in three of those and get sufficient strength? If we can allow defects, in what part of the member can they be permitted? Does the strongest plank of the five break first or does it break last? Those and numerous other questions can be asked, but some of them cannot very well be answered until a great deal more work is done.

In the section of wood preservation we formerly confined ourselves to the study of the preservative treatment of wood, the durability of wood and the fire-proofing of wood. But because we were called on for so many other things during the war, we had to include also the study of glues and glueing, the study of the manufacture of airplane propellers and methods of coating wood to prevent the entrance of moisture. An airplane propeller is a rather delicate instrument. If it is not properly balanced it is likely to tear the engine from its bearings when it gets to going 1,500 or 1,800 revolutions per minute. If it warps a little bit more one one side than it

does on the other, it is apt to be inefficient, or to damage the machine. It has been found that changing moisture content causes the warping and shrinking of wood. When water leaves wood it shrinks. When water is absorbed by wood, the wood swells. If wood is to "stay put"—to remain at the size desired—the moisture must be kept from changing back and forth.

Airplane propellers are used out in the open and cannot be protected like a piece of furniture. They needed, then, a method of keeping out moisture which was better than anything we knew of. It is commonly considered that varnish will prevent the absorption of moisture. As a matter of fact, varnish merely retards the absorption. Ultimately, if the varnished piece of wood is kept under constant conditions, the moisture will come to practically the same point that it would if there were no varnish present.

Various methods of preventing moisture changes were studied. Finally, by accident, as much as anything else, a method which is nearly one hundred per cent. efficient was discovered. This is done by first sizing the wood, then coating it with varnish, then, while the varnish is still "tacky," laying very thin aluminum leaf on it and afterwards varnishing again. That gives a thin metal coating around the wood. Its weight is negligible. It takes less than half a gram of aluminum leaf to coat an eight-foot propeller. The aluminum leaf is so thin that it takes about 15,000 sheets to make an inch. The cost of it is practically nothing. So we have for airplane propellers a means of keeping out moisture that is entirely practical. The process also has possibilities for other purposes that have not yet been worked out.

WE have a big subject in the study of glues. You may not realize that glue is really a structural material. It permits the manufacture of ply-wood and out of ply-wood airplanes are made. If we had this ideal glue our whole system of forestry might be altered. By means of glue small pieces of wood can be joined together to make large pieces. Waste wood can be used in that way to a greater extent than available means now permit. We would not have to wait for trees to grow so large as they do now to get large timbers. Until we find that perfect glue, however, we will have to continue along many lines very much as we have in the past. We must take advantage of each progressive step and use it to its fullest measure, and hope that some day, somebody will find the perfct glue.

In wood prservation we have studied methods of injecting preservatives into woods; how different woods take preservative treatment; and methods of protecting piling against decay and marine borers. How can the damage created by marine borers be prevented? A great deal, of course, is already known. The use of creosotes is fairly well, but not well enough, understood. We do not know what is the best creosote to use against marine borers. We do not know how to get the best penetration; how to get the oil in uniformly and deeply enough. It will take a long time to find the preservative which will prevent marine borers from attacking timber throughout its useful life. The same is true, to a certain extent, of preventing decay in land structures.

The structural engineer and architect can find information on safe working stresses for structural timbers, the effect of defects on strength, the effect of seasoning on strength, density grading rules, the durability of various species of wood, the efficiency of joints and fastenings, and the strength of built-up or laminated structural members.

More and more people are learning what the laboratory is and what it has, by writing in for information on technical problems. Sometimes they get what they want. Sometimes they must be disappointed because the information is not available. We give them the best we can.

Supporting Strength of Drain Tile and Sewer Pipe Under Different Pipe-Laying Conditions

Under the above title, the Iowa State College of Agriculture and Mechanic Arts of Ames, Iowa, has issued bulletin 57, prepared by W. J. Schlick, drainage engineer.

The purpose of the tests was to obtain reliable data for the use of those engaged in the design and construction of such work. The engineers charged with the design of pipe drains and sewers have been compelled, until within comparatively recent years, to depend wholly upon rule-of-thumb methods to determine whether or not the pipe to be used in each drain or sewer would have the supporting strength required safely to support the loads due to, or transmitted through, the ditch filling materials. This practice has resulted necessarily in the construction of many drains and sewers which later cracked and often collapsed because of insufficient supporting strength.

Copies of this bulletin may be obtained through a request addressed to the Engineering Experiment Station, Ames, Iowa.

XUM

Some Phases of Lumber Manufacture

I.—Shingles in the Making

By R. S. Whiting, *Architectural Engineer*

Of the materials in most common use and particularly those constantly before us we give perhaps less thought than to those which are not so common but which have been more recently brought to our notice, because of the new properties they may possess, or because of a supposed need they may seem to fill.

Shingles, for example, are one of the oldest of

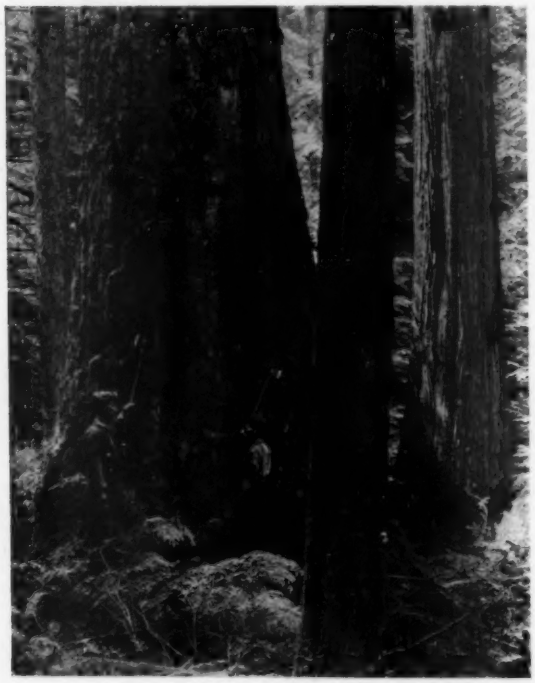


FIG. 1. SELECTING STANDING TIMBER SUITABLE FOR FELLING

our building materials, having been in constant use in this country for nearly three hundred years. Because of the great demand for them the old methods of manufacture have long since been done away with and have been replaced by the use of the most modern machinery. Shingles were first rived from the solid wood and later split in order to obtain a straight and more even gran. Now they are manufactured in a most scientific and economical manner.

To correct the impression that shingles are manufactured from slabs and other waste from the log, these reproductions, showing the process of manufacture from the log to the finished material, have been made. The views illustrating this article were taken in a typical shingle mill in the Northwest where most of our shingles are manufactured and are intended to show as nearly as possible the complete process of their manufacture.

Of the eleven hundred shingle mills operating in the United States, the majority of them are located on some body of water where the logs may be conveniently floated into the "pond" adjoining the mill. From this they may be easily carried to the second floor by means of a conveyor. After they have been washed by a spray of water, the conveyor further brings them to the teeth of the first saw where they are cut into "bolts" sixteen, eighteen or twenty inches thick, depending on the length of shingles required.

These "bolts" are then passed along to the second saw where each of them is "quartered," and thence to a third where they are trimmed and the defects cut out. The quartering of the bolts not only works them down to a more practical size to be handled in the process of manufacture but also is the initial operation by which an edge grain shingle is made.

An edge grain shingle, because of the natural grain of the wood, will not warp or curl when in place on the roof or wall of a building, because of atmosphere conditions, and is, therefore, much preferable to flat grain shingle for exterior coverings for buildings. The flat grain shingles will cup and curl when subjected to the hot rays of the sun,

FIG. 2. THE LOG BEING CUT INTO "BOLTS"

FIG. 3. QUARTERING

often to such an extent that the surface over which they are placed will become leaky.

The bolts, after being quartered and trimmed, are passed on to the "shingle machine" where they are run through two more saws completing the process of manufacture. Each quarter bolt is gripped in the machine which moves forward and backward on the fourth saw automatically feeding out the bolts as the saw cuts off the shingles. The shingles then drop to the left of the machine operator who squares up the edges by means of a fifth and last saw.

As the machine operator completes his part of the work, the finished shingles are passed down a chute to the "packer" on the floor below, where they are gathered in bundles of a standard size, banded and placed on conveyors which carry them to freight cars to be packed for shipment.

When shingles are to be dried they are either piled on trucks and run into the kiln for the required length of time or stacked out of doors for nature to do the drying. In either case, after being dried, it is necessary to reband the bundles since in the process of drying there is some shrinkage which loosens the shingles in the bundle.

Shingles are packed so that there are a sufficient number in each four bundles to cover an area of 100 square feet, commonly known as a "square," when laid on a roof or wall surface. The average exposure to the weather when laid on a roof is four and one-half inches and on walls five inches. When laid four and one-half inches to the weather there are about 863 shingles to the square, and when laid five inches to the weather about 782 shingles, using the unit shingle which has a width of four inches. As a matter of fact, however, there are on the average 460 actual shingle pieces in one square of 16-inch shingles.

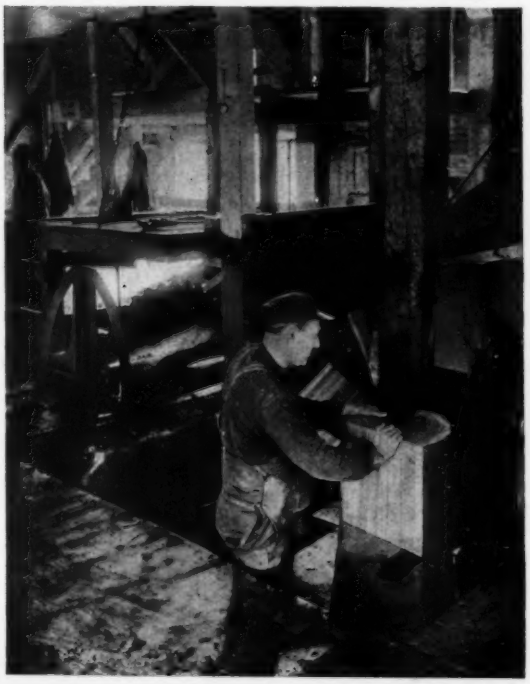


FIG. 4. QUARTER SECTIONS BEING TRIMMED
It is in this part of the process that any defects appearing in the lumber are cut out

FIG. 5. THE SHINGLE MACHINE
The quarter sections are gripped by machine at left, which moves forward and backward on saw. Machine operator squares up edges

The number of shingles reported produced in the United States during the year 1918 was 5,690,182,000, three-fourths of which number were manufactured in the state of Washington. These shingles, if laid four and one half inches to the weather, would cover an area of equal to 647,761,500 square feet or 23 square miles.

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The terms 5 to 2 and 6 to 2 refer to the standard thickness and mean that five shingles will measure 2 inches in thickness at the butts or six shingles will measure 2 inches in thickness at the butts. That is, the fewer the number of shingles measuring 2 inches at the butts, the thicker the shingles.

Four bundles of 5 to 2—16-inch shingles (enough to cover a square of roof or wall surface) will weight about 160 pounds and the same number of bundles of 6 to 2—16-inch shingles will weight about 140 pounds, while four bundles of 5 to 2—18-inch shingles will weigh about 150 pounds.

It will thus be seen that the production of the shingle forms an important branch of the lumber industry. For suburban structures, and especially

FIG. 6. THE SHINGLES ARE BUNDLED AND CONVEYED TO FREIGHT CARS

dwellings, wood shingles have been and still are used extensively. In congested sections, the buildlaws usually require the roof surface to be of incombustible material. When properly painted the fire hazard of the shingle roof is materially reduced. Special fire-retardent paints are made for shingles containing asbestine and other mineral pigments not reducible to metals. These are ground in linseed oil with thinner and drier. The preservative qualities of shingle *stains* are well known. They are usually prepared of a high grade of creosote mixed with various colors and ground in oil. Attractive finishes in many colors are thus to be had.

Fire Protection and the Lumber Industry.

IN an address before the Southern Pine Association, Mr. Wharton Clay, Commissioner of the Associated Metal Lath Manufacturers, chose the above title as his topic. Copies of this address, reprinted from the American Lumberman, have been widely distributed by the National Fire Protection Association.

The combustibility of the frame structure has

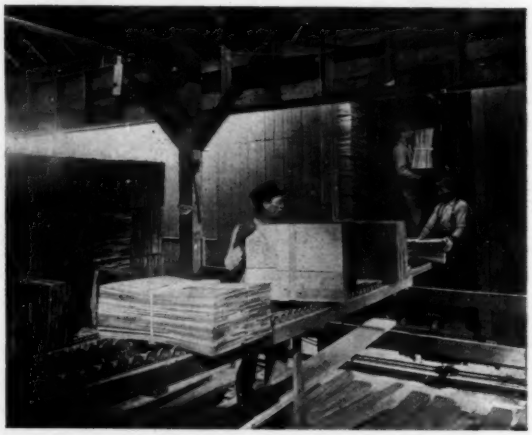

FIG. 7. ENTERING THE FREIGHT CAR READY FOR USE

always been a talking point in favor of other types of buildings. We have not yet developed a type of construction totally unaffected by fire, and, therefore, the fireproof building is yet an ideal to strive after and not an accomplished fact. What we have done is to develop types of construction that are fire resisting to varying degrees. The timber struture is not necessarily the one which will be the most greatly damaged by fire. Some of the old log cabins could well resist the effects of this destructive agent. One of the safest types of structure from the fire hazard standpoint, known as "mill construction," employs the use of heavy timbers. But wood will burn, and the common type of frame building is undoubtedly a fire hazard in built-up sections. However, as Mr. Clay points out, timber can be protected and frame structures thus rendered more fire resisting. In his address he stated:

"Your industry has done splendid work in cooperation with various insurance and fire prevention agencies on mill construction and placed this type of a building in high public esteem. There is no reason why the neglected construction, consisting of joists and studs, which affects such a large percentage of the lives of the common people, should not be equally studied from a scientific standpoint and made equally as safe from fire. Single handed, the Associated Metal Lath Manufacturers have established the 1-hour rating for exterior stud walls, and every indication points to a 1-hour rating for interior bearing partitions, and I am asked to announce at this meeting that the National Lumber

Manufacturers' Association and ours will jointly apply to the Underwriters' Laboratories for a test and rating on the other principal structural element in this type of building; namely, floors with wood joists protected by metal lath."

It would seem that, in line with other conservation measures, the lumber industry could do real public service by co-operating to the fullest extent with all other agencies who have for their object a reduction of the fire loss. More important than ever before is the need of conserving the homes now being built, for they are doubly needed.

The Use of Linoleum as a Safety Stair Tread

A Further Discussion of Accident Prevention on Stairways

THE necessity for correctly designing stairways is being realized to an increasing extent. The figures given in the article entitled, "Safety Engineering," published in the June 16 issue, furnish opportunity for thought. A great many accidents are caused by slipping in public places, such as stairs, corridors, etc. Several types of safety treads were discussed in a paper by G. L. H. Arnold, entitled, "Factory Stairs and Stairways," published in two parts (see THE AMERICAN ARCHITECT, issues of January 28 and February 4, 1920), the types of treads discussed therein being by no means restricted to factory use. Additional materials for special uses are available.

In public and semi-public buildings where quietness, non-slipperiness and durability are essential to the staircase, stair treads surfaced with linoleum have been found to give satisfactory service. This material can be readily applied either to new or existing stairs, whether of wood, metal or concrete.

The heaviest grade of plain linoleum, one-quarter inch thick and known as Battleship, is best suited for heavy traffic conditions. For a wood stair, a pad of linoleum should be cut the exact size of the tread and cemented firmly to its upper surface with a high grade waterproof linoleum cement. A shellac cement is recommended. The cheaper cements usually contain sodium silicate (water-glass) which, in the presence of water, becomes injurious to all linoleum.

As a nosing to protect the forward edge of the surface from breaking or being torn loose by the traffic, a brass strip may be attached to the edge of the step, brought flush with the surface. This provides satisfactory protection, with a minimum of metal on the tread proper, and at the same time gives a neat and finished appearance to the stair.

In installing linoleum on a metal tread the same method of cementing as employed over wood will serve. That a good adhesive will hold to iron is proved by the United States Government's experience in cementing thousands of yards of linoleum to the steel decks of battleships every year. Care must be taken, where the nosing forms a part of the metal riser or tread, to cut the linoleum to fit snugly against the nosing as well as against the other edges of the step. In case the metal stair has no built-on nosing, such a strip of brass or other metal may be employed as with wood.

For a concrete stair, linoleum may be used to serve both as tread and as riser, if desired. The concrete must be given a smooth and even finish, as any inequalities will also appear on the linoleum surface. The concrete must also be thoroughly dry, as any moisture remaining in it will tend to lessen the adhesive powers of the cement. Two or three months, depending on weather conditions, should be given the concrete for seasoning before the surfacing material is applied. A metal nosing, anchored in the concrete when it is laid, is most satisfactory. The nosing should be set a quarter inch above the surface of the concrete, so as to finish flush with the linoleum when the latter is cemented down. In case linoleum is to cover the riser, similar precaution should be taken to make the forward edge of nosing cover the upper edge of the linoleum riser. Separate pieces of linoleum should be cut to fit exactly the tread surface and the riser surface and cemented in place.

It is often found advisable to install linoleum on the treads over a layer of building felt paper. In the case of concrete, felt paper helps take up any irregularities there may be in the surface, while with wood stairs it absorbs any expansion or contraction that may take place, thereby lessening the strain on the linoleum. When it is desired to use the felt layer, this material, cut to proper size, is first cemented to the step, after which the linoleum is cemented down firmly on top of the felt.

A linoleum stair offers the same ease of cleaning that has made this material invaluable as a household floor. Its non-slip qualities, due to the large percentage of cork used in its manufacture, are well known. The resiliency of the cork, which enables the foot to gain a firm grip on the step, also renders the linoleum stair a quiet stair, especially

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suitable for hospitals and sanitariums where silence is a necessity. The material withstands severe abrasion tests, and stairs covered with it have stood up under hard usage for many years.

Figures 1 to 4 illustrate the methods here described.

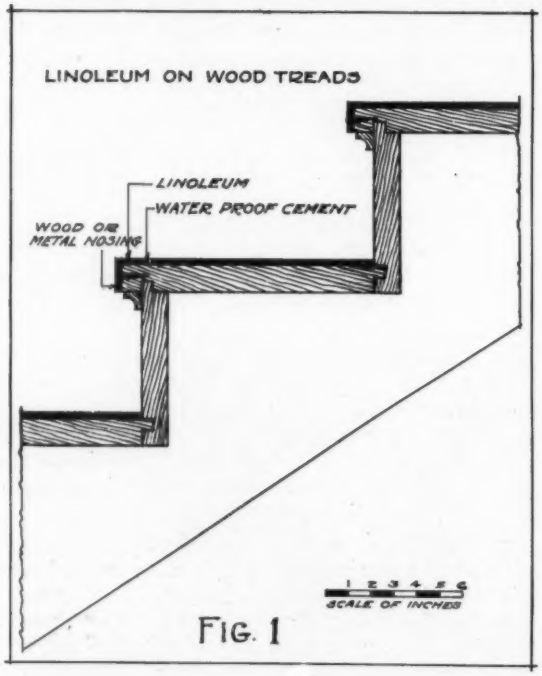

FIG. 1

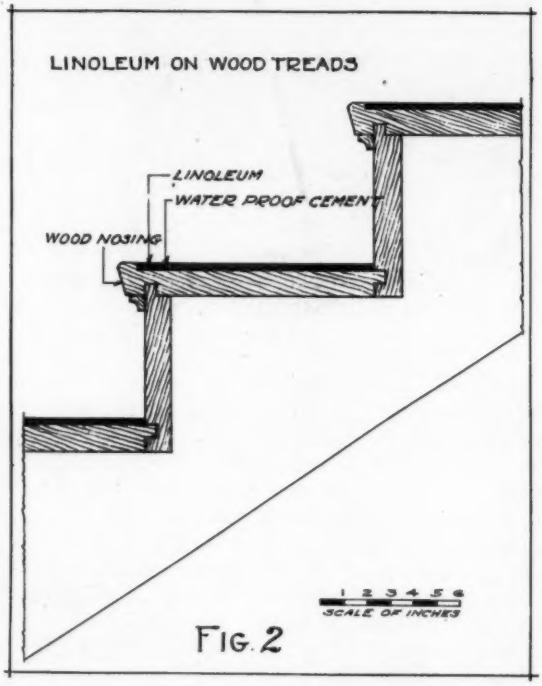

FIG. 2

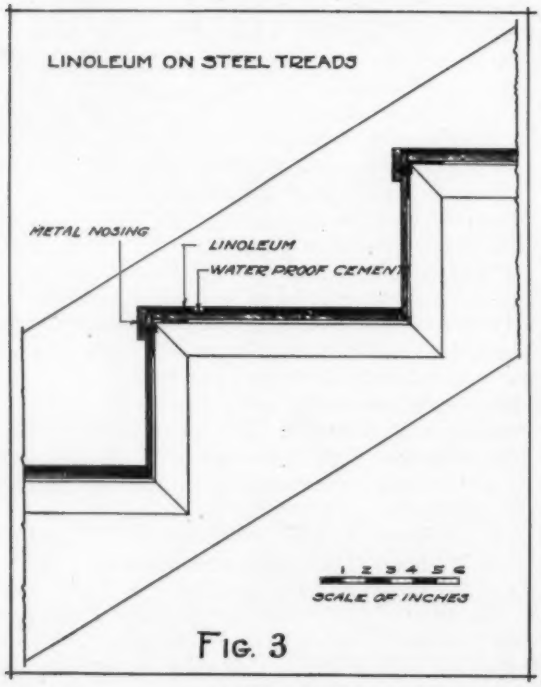

FIG. 3

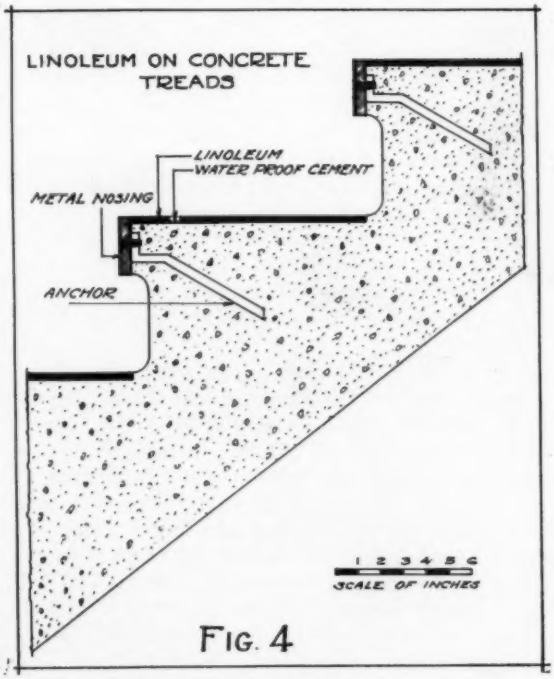

FIG. 4

CONSTRUCTION DETAILS FOR THE LINOLEUM STAIR TREAD

Brick Chimneys and Wall Shingles finished with Cabot's Old Virginia White
John Russell Pope, Architect, New York

Cabot's Old Virginia White

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BUILDING NEWS

CALIFORNIA.

FULLERTON, CAL.—Fullerton Union High School will construct domestic science and art building.

GILROY, CAL.—Natl. Ice & Cold Storage Co., Postal Telegraph Bldg., San Francisco, will construct 1 story, rein.-con. and hollow tile storage building here. $100,000.

LOS ANGELES, CAL.—Gore Bros. retained A. B. Rosenthal, archt., Douglas Bldg., to prepare plans for fireproof construction theatre, office and store, on Hollywood Blvd., also 10 story, 140 x 350 ft., at 550 South Main St. $500,000 and $2,000,000 respectively.

LOS ANGELES, CAL.—Bd. Educ. will build 1 and 2 story, 132 x 220 ft., brick school on East 7th St. $168,000.

PASADENA, CAL.—Pasadena Hospital Assn. retained M. Hunt, archt., 1107 Hibernian Bldg., Los Angeles, to prepare plans for rein.-con. hospital, on Fremont and Congress Sts. $350,000.

RICHMOND, CAL.—Bd. Educ. retained J. T. Narbett, archt., 904 Macdonald Ave., to prepare plans for school on 8th and Bissell Sts., cost $200,000; Stege School, $45,000; Fairmont School, $20,000; Nystrom School, $20,000; school in East Richmond, $15,000; Grant School, $15,000. $565,000.

STOCKTON, CAL.—Bd. Supervs. San Joaquin Co. retained Wright & Satterlee, archts., to prepare plans for buildings and improvements to Agricultural Park, to include 100 x 200 ft. machinery hall, 200 x 300 ft. auto exhibit building, stock and poultry exhibit buildings, inn, restaurant, dance pavilion, concession zone, electric light and power plant, alterations to present buildings, etc. $1,000,000.

DELAWARE.

WILMINGTON, DEL. — Automobile Supply Co., c/o Greisler & Abramson, archts., and engrs., Lafayette Bldg., Phila., will build 3 story, 40 x 70 ft. concrete and brick garage on 12th and French Sts. $50,000.

FLORIDA.

ORLANDO, FLA.—Dickson-Ives Co. let contract for building 5 story, 68x120 ft., rein.-con., brick and stone store on Central and Orange Aves., to C. E. Hillyer Co., Blum Bldg., Jacksonville. $150,000.

TAMPA, FLA.—Maas Bros., Franklin and Zack Sts., will build 8 story, 105 x 112 ft. concrete and brick store. $500,000.

GEORGIA.

LAGRANGE, GA. — First Baptist Church had plans prepared by S. Hamilton, archt., Flatiron Bldg., Atlanta, for brick and lumber church. $150,000.

ILLINOIS.

CHICAGO, ILL.—Cohan & Harris, 226 West 42nd St., New York City, have renewed lease on Grand Opera House at 119-121 North Clark St., and plan to build new theatre. $300,000. A. N. Rebori, 410 South Michigan Ave., archt.

CHICAGO, ILL.—Jones, Linick & Schaefer, 336 South State St., have secured lease on ground occupied by McVickers Theatre, at 19 West Madison St., and plan to build new theatre. $1,000,000.

CHICAGO, ILL.—Monighan Machine Co., 2036 West Carrol Ave., will build 1 story, 110 x 504 ft., steel factory, on Augusta and Kilpatrick Sts. $250,000.

CHICAGO, ILL.—Cohan & Harris, 226 West 42d St., New York City, have renewed lease on Grand Opera House at 119-121 North Clark St., and plan to build new theatre. $300,000. A. N. Rebori, 410 South Michigan Ave., archt.

CHICAGO, ILL.—Jones, Linick & Schaefer, 336 South State St., have secured lease on ground occupied by McVickers Theatre, at 19 West Madison St., and plan to build new theatre. Cost between $500,000 and $1,000,000.

INDIANA.

EVANSVILLE, IND.—Indiana Atomized Fuel Co. will build 1 story, 80 x 100 ft. steel plant. $150,000. B. U. Cain, secretary.

FT. WAYNE, IND.—General Electric Co., Bway., will construct 2 and 3 story, 150 x 300 ft., lamp works and office building, rein.-con., on Winter St. $400,000.

IOWA.

COUNCIL BLUFFS, IA.—Independent School Dist. let contract for building 2 story, 75 x 135 ft., rein.-con., stone and brick school. A. H. Neumann & Co., 519 Hubbell Bldg., Des Moines. $333,561.

DES MOINES, IA.—Natl. Biscuit Co., 10th and Cherry Sts., will build 1 story, 77 x 112 ft., brick, rein.-con. and steel warehouse on East 3rd St. and Court Ave. $70,000.

DES MOINES, IA.—Des Moines Fdry, & Machine Co., 314 Flynn Bldg., proposes building 1 story, 130 x 220 ft., brick, rein.-con. and steel foundry and machine shop on 16th St. and Wabash Ave., 17 Battery Pl., New York City. $350,000.

GREENE, IA.—School Bd. will build 2 story, 66 x 127 ft., rein.-con. and brick high school. $125,000.

WHITTEN, IA.—Bd. Educ. will build 3 story, 55 x 85 ft., brick school. $106,000.

KANSAS.

LEAVENWORTH, KAN.—Moore Lawless Elevator Co. will remodel plant and build 6 rein.-con. grain storage bins.

WICHITA, KAN. — Arkansas Valley Interurban R.R., 126 West 1st St., proposes building 2 story, 80 x 112 ft., brick, rein.-con. and steel station. $333,561.

KENTUCKY.

ASHLAND, KY.—Field Furniture Co. proposes building 6 story, 30 x 145 ft. store on Main St., to C. S. Cox, Ashland. $130,000.

NEWPORT, KY.—O. Zimmerman & Sons, 5th and Sycamore Aves., Cincinnati, O., will build 2 story, 80 x 150 ft. printing plant, concrete, at 120 East 3rd Ave. $100,000.

LOUISIANA.

NEW ORLEANS, LA.—New Orleans Cotton Exchange, Weis Bldg., will build 7 story, 76 x 120 ft., rein.-con., steel and stone exchange on Carondelet and Gravier Sts. $1,000,000.

MARYLAND.

BALTIMORE, MD.—K. Bubert, 200 East Lexington St., will build 4 story, 32 x 125 ft., concrete, brick and steel bank at 216 East Lexington St. J. E. Moxley, 1729 Ellamont Ave., archt.

BALTIMORE, MD.—City Council will build 3 story, 63 x 121 ft., brick and stone school. $400,000.

FREDERICK, MD. — School Comrs. Frederick Co. will build 2 story, concrete and brick addition.

POCOMOKE, MD.—M. Clogg will build 1 story, 150 x 220 ft. brick and stone garage and warehouse, to McIver Construction Co., 706 Law Bldg., Baltimore. $65,000.

MASSACHUSETTS.

CAMBRIDGE, MASS.—Notre Dame de Petrie, c/o C. R. Greco, archt., 8 Beacon St., Boston, will build 1 story, 75 x 190 ft., brick, steel and stone church on Harvey St. $150,000.

GARDNER, MASS.—E. F. Stevens, archts., 9 Park St., Boston, will build 3 story, 40 x 110 ft., brick and rein.-con. hospital on Woodland St., for Henry Heywood Memorial Hospital. $100,000.

SOUTH HANSON, MASS.—Comrs. Plymouth Co., Plymouth, propose building 2 story, 80 x 105 ft., frame and stucco hospital. $100,000.

WEST ROXBURY, MASS.—Bd. Educ., Boston, received only bid building 3 story brick and steel addition to Mary Lyons High School, rein.-con. flooring, concrete foundation, on Elm St., here, from Langan & Shaw Constr. Co., 80 Boylston St., Boston. $226,285.

WINTHROP, MASS.—Town will build 2 story, 67 x 121 ft., concrete, steel, limestone and brick school. $165,000.

MICHIGAN.

DETROIT, MICH.—A. Colton Co., 782 Jefferson Ave., will build 3 story, 60 x 100 ft., rein.-con. factory. $50,000.

DETROIT, MICH.—Ft. Shelby Hotel Co., Lafayette Blvd., and 1st St., plans to build 6 story, 600 room, rein.-con., brick and steel addition.

DETROIT, MICH.—S. E. Remey, archt., Whitney Office Bldg., preparing plans for 6 story, 80 x 200 ft., rein.-con., brick and steel office on Woodward Ave. $150,000.

DETROIT, MICH.—M. Manterias, care of A. H. Gould & Son, engrs. and archts., Empire Bldg., having plans prepared for 4 story, rein.-con., brick and steel commercial on Woodward Ave. $200,000.

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FOR many years we have backed up our belief in Barrett Specification Roofs with a Surety Bond guaranteeing these roofs to be free from repair or maintenance expense for at least 20 years. We are often asked how we *dare* give such a Bond.

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We do not lay roofs ourselves. That is always done by a roofing contractor. We have therefore, no motive for cheapening the job or passing as satisfactory any faulty construction. On the contrary, it is to our interest to see that every bit of material is of the grade specified, that all of it is used, and that it is used properly.

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This means that we are going to see to it that you, as a building owner, get all that you pay for—not only for *your* protection, but for our own as well.

Barrett Inspectors watch every Bonded Barrett Specification Roof during construction to see that the specified materials are used and that they are properly applied.

As a further precaution, after the roof is laid, and before the final surfacing of gravel or slag is added, a Barrett Inspector makes an Inspection Cut for every 25 squares of roof area, as shown by photographs at bottom.

After the cut sections have been replaced and covered by an equal number of layers of pitch and felt, the final surfacing is applied to the whole roof —75 pounds of pitch covered with a protecting layer of 400 pounds of gravel or slag to every 100 square feet.

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The Barrett Specification Type "A A" 20-Year Bonded Roof represents the most permanent roof-covering it is possible to construct, and while we bond it for twenty years only, we can point to many roofs of this type that have been in service over forty years and are still in good condition.

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Our only requirements are that The Barrett Specification, *revised April 15, 1920*, shall be strictly followed and that the roofing contractor shall be approved by us and his work subject to our inspection.

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Note the thickness of this heavy, waterproof blanket. After the piece of roofing has been replaced and the cut covered by an equal amount of material, 75 pounds of pitch, a protecting layer of 400 pounds of gravel or slag is applied to each 100 square feet.

DETROIT, MICH. — Bemb-Robinson Co., Jefferson Ave., E., will build 3 story, 100 x 120 ft., rein.-con. and brick garage, on Congress St. $90,000.

GRAND RAPIDS, MICH.—Oliver Mchy. Co., Clancy and Coldbrook Sts., will alter and build 1 story addition to foundry, brick and steel. $50,000.

JACKSON, MICH.—Frost Gear & Forge Co., Horton and Tyson Sts., will build two 1 story, 50 x 160 ft. and 40 x 100 ft., brick and steel factories. $80,000.

PONTIAC, MICH.—E. S. Milward, Pontiac, will build 2 story, 93 x 120 ft., rein.-con. and brick garage and shop on South Saginaw St., to Pryall Constr. Co., Pontiac. $50,000.

PORT HURON, MICH.—Bd. Hospital Trustees retained G. L. Harvey, archt., Huron Ave., to prepare plans for 3 story, 50 x 80 ft. addition, concrete, brick and steel hospital on Willow and Richardson Sts. $150,000. C. C. Clancy, pres.

SAGINAW, MICH.—Aero Cushion Inner Tire & Rubber Co., 909 Ford Bldg., Detroit, will build 2 story, 80 x 220 ft., rein.-con., brick and steel factory. $75,000.

MISSOURI.

ST. LOUIS, MO.—Liggett & Myers Tobacco Co., Folsom and Tower Grove Aves., will build warehouse, at 3941-55 Park Ave. $150,000.

ST. LOUIS, MO.—Trinity Methodist Episcopal Church, 13th & Tyler Sts., proposes building 1 story, 43 x 100 ft., fire proof warehouse, at 1222-30 Tyler St. $54,000.

ST. JOSEPH, MO.—Natl. Blk. Amusement Co., will remodel rein.-con. and steel theatre. $110,000.

NEBRASKA.

LINCOLN, NEB.—Bd. Educ. will build Prescott School, 2 story, rein.-con., brick and steel. $600,000. Fiske & Meginnis, 533 Bankers Life Bldg., archts.

NEW HAMPSHIRE.

LACONIA, N. H.—Business and professional men of Laconia plan to raise $100,000 for the erection of an addition to the Laconia Hospital.

MANCHESTER, N. H.—A 4 story brick apartment building will be erected at the northwest corner of Elm and West Clarke Sts. Randolph W. Branch, head of project. $120,000. Philip Avery of Boston, archt.

NEW JERSEY.

AUDUBON, N. J.—Board of Education, Borough of Audubon, County of Camden, N. J., will erect a 10-room addition school house No. 2, and a 4-room addition to school house No. 3. John H. Mowere and David C. Large, archts.

NEWARK, N. J.—The General Lead Batteries Company contemplates the erection of a 2 story concrete building in Chapel St. near Lister Ave. at $70,000. Timmis and Chapman, archts., New York.

NEWARK, N. J.—Board of Freeholders and the Board of Managers of the County Hospital at Soho consider the erection of a series of five connecting hospital buildings. Dr. Henry E. Ricketts, Medical Superintendent of the hospital.

NORTH ARLINGTON, N. J.—Alteration and additions to Borough Hall are proposed. Ralph Calabrese, architect, North Arlington.

TRENTON, N. J.—Housing for inmates at the Reformatory for Women, Clinton, N. J., also for a laundry at the Reformatory for Women are proposed. Francis H. Bent, State Architect.

TRENTON, N. J.—Department of Agriculture, 141 West State St., will erect a new wing on the State House, Trenton, N. J., Francis H. Bent, State Architect.

NEW MEXICO.

ALBUQUERQUE, N. MEX. — Joseph Barrbett is planning the erection of a new theater at a cost of over $100,000.

ALBUQUERQUE, N. MEX.—Trost and Trost, archts., George D. Hill, associate, Chamber of Commerce, Albuquerque, N. Mex., will erect seven school buildings. $400,000.

NEW YORK.

BROOKLYN, N. Y.—C. B. J. Snyder, supt. school bldgs., Municipal Bldg., New York City, proposes building P. S. 185, easterly side of Ridge Blvd. from 86th to 87th Sts., here. $657,000.

BROOKLYN, N. Y.—Holy Name Catholic Church, 245 Prospect Park West, will build 2 story, 70 x 245 ft., brick, steel and stone school on Howard Pl., to H. Veit, 258 Devoe St. $160,000.

BROOKLYN, N. Y.—Sheffield Theatrical Co., 645 Georgia Ave., will build 1 story, 85 x 200 ft., brick and stone theatre on Cleveland St. $150,000.

BUFFALO, N. Y.—M. H. Birge & Sons, 390 Niagara St., will build 2 story, brick and concrete office. $100,000.

BUFFALO, N. Y.—John F. Malone, Commissioner of Parks and Building, will erect a 1 story frame shelter house on the Harrison Playground, Milton and Westcott Sts.

NEW YORK CITY, N. Y.—Board of Health, 505 Pearl St., Manhattan, will repair certain baby health stations for the Department of Health, Borough of Manhattan, Bronx.

NEW YORK CITY, N. Y.—A total of more than $1,000,000 will be spent on a novel housing project for residents of the fashionable Fifth Ave. district on the west bank of the East River, according to the Sutton Place Block. Willott Cross, archt.

NORTH CAROLINA.

RALEIGH, N. C. — Gilmore Bros., Winston-Salem, will build 3 story, concrete store. $250,000.

NORTH DAKOTA.

WASHINGTON, N. D.—Library Board will construct a brick and stone library building. W. E. Mohler, archt., Wahpeton, N. D.

OHIO.

AKRON, O.—About $5,000,000 will be expended by Akron Public Schools the coming year. Improvement will include school buildings at Goodyear Heights, Perkins, Norman, Crouse and McEnright Schools and repairs on the other school buildings of the city.

AKRON, O.—Bids will be readvertised for the constultion of the Goodyear Heights School Building, at Brittain Road and Newton St., by Board of Education, Central High School Bldg., Akron.

BUCYRUS, O.—Willing Bros., Bellevue, O., awarded contract for building the high school here, at $483,759.

CANTON, O. — McLaughlan-English, Inc., plans to build 8 story, 66 x 200 ft. concrete, steel and brick business on Tuscarawas and Cleveland Aves. $700,000. C. B. Firestone, Renkert Bldg., archt.

CHILLICOTHE, O.—The Mead Pulp and Paper Company will increase its capital stock from $1,500,000 to $6,300,000. It is proposed to use the increase for the expansion of mill in Chillicothe.

CINCINNATI, O. — University Club, 4th St. and Bway, having sketches made by Zettel & Rapp, archts., Mercantile Library Bldg., for altering 4 story, rein.-con., steel and brick club. $150,000.

CINCINNATI, O.—King Machine Tool Co., Clifton Ave. and Baltimore & Ohio Southwest R.R., proposes building 1 story, 30,000 sq. ft. machine shop, brick and steel, to H. C. Hazen Constr. Co., 2070 Reading Rd. $70,000.

CINCINNATI, O.—Lunkenheimer Co., Beekman and Tremont Sts., proposes building 1 story, 350 x 400 ft. concrete, steel and brick foundry. $100,000.

CLEVELAND, O.—G. Paul, 524 Citizens Bldg., plans to build brick, steel and concrete commercial on Euclid Ave. near East 40th St. $200,000.

CLEVELAND, O.—Bd. Educ. plans to build 1 story school for crippled children, brick, steel and concrete school. $350,000. W. R. McCornack, East 6th St. and Rockwell Ave., archt.

CLEVELAND, O.—Bd. Educ. plans to build 3 story, brick, steel and concrete school on Diana and Darley Aves. $600,000. W. R. McCornack, East 6th St. and Rockwell Ave., archt.

CLEVELAND, O.—A. Catholic institution will be constructed for the Sisters of the Good Shepherd.

CLEVELAND, O.—Bd. Educ., East 6th St. and Rockwell Ave., plans to build addition to Rickoff School, Kinsman Rd., and 1 story, 30 room, on Spring Rd., brick, concrete and steel. $350,000 and $1,000,000 respectively. W. R. McCornack, East 6th St. and Rockwell Ave., archt.

CLEVELAND HEIGHTS, O. — Heights Savings & Loan Co., 520 Erie Bldg., Cleveland, plans to build 2 story, brick, steel and concrete bank. $100,000.

CLEVELAND, O.—Cleveland Electric Illuminating Co., Pub. Sq., will construct two 1 story, 40 x 57 ft. electric apparatus buildings, brick, steel and concrete, at 1966 East 55th St. and 5317 St. Clair Ave. $100,000.

CLEVELAND, O. — Cleveland Ry. Leader-News Bldg., will build 1 story, 47 x 64 ft. electric sub-station, brick,

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A complete as received double-hung window with 100% opening, yet normal in appearance and operation.

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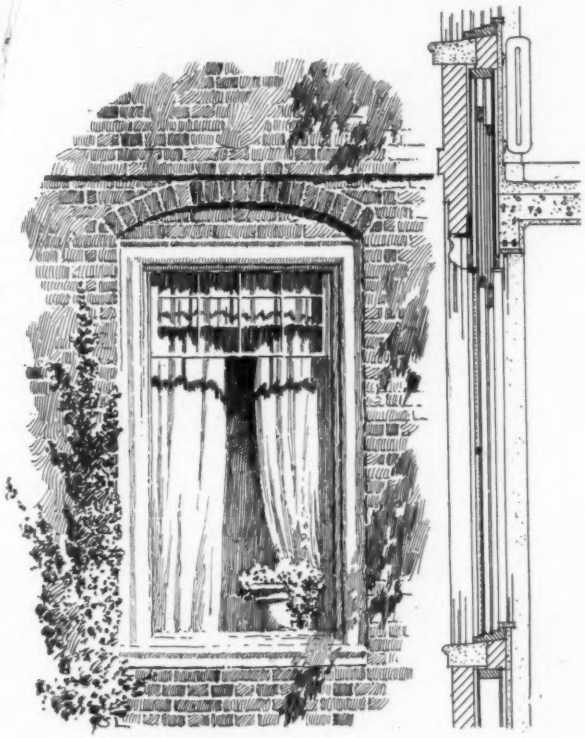

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steel and concrete, on East 99th St. and St. Clair Ave. $100,000.

CLEVELAND, O.—Union Club, East 12th St. and Euclid Ave., will model hollow-tile, brick and marble club. $100,000.

GALLIPOLIS, O.—Bd. Administration, Oak St., Columbus, building 1 story, 78 x 117 ft., brick and concrete cottage at Ohio Hospital for Epileptics, here. $100,000.

COLUMBUS, O.—A gift of $400,000 was made by C. F. Ketterling, wealthy Dayton trustee, to be used for the construction and maintenance of a research laboratory for the college of homeopathic medicine. The building will be located between the hospital and Neil Ave.

DAYTON, O.—Expenditures of approximately $10,000 will be made by Mrs. G. H. Carnell in equipping and beautifying Stuart Patterson Park, North Dayton. Louis Lott, archt.

DELAWARE, O.—Wesleyan University is to have a new observatory which will cost $230,000.

EAST CLEVELAND, O.—Bd. Educ. received bids building 2 story, concrete, steel and brick school on Mayfair Rd. $182,600.

ELYRIA, O.—First Natl. Bank will build 3 story, 25 x 132 ft., brick, steel and concrete bank on Public Square, to Van Blarcom Constr. Co., East 22nd St. and Prospect Ave., Cleveland, O.

KENT, O.—Bd. Educ. having sketches made by Mills & Millspaugh. archts., Marshall Bldg., Cleveland, for 3 story brick, steel and concrete high school. $450,000.

MANSFIELD, O.—The Ideal Electric & Mfg. Co., 153 East 5th St., will construct 1 story, 160 x 450 ft. and 100 x 450 ft. brick and steel factory, and 2 story, 35 x 75 ft. office building. $350,000.

MASSILLON, O.—Bd. Educ. will build 2 story, 75 x 94 ft., brick, steel and concrete school on Pearl St. $200,000. O. D. Howard, 8 East Broad St., Columbus, archt.

MASSILLON, O.—Bd. Educ. proposes building 2 story, 76 x 90 ft., brick, steel and concrete school on Cherry St., to J. Meinhardt, Massillon. $100,000.

SPRINGFIELD, O.—Municipal Hospital having plans prepared by R. C. Gotwald. 54 Gotwald Bldg., Springfield, and S. Hannaford, Hulbert Blk., Cincinnati, archts., for 4 story brick and concrete nurses home on York St. $250,000.

WILLOUGHBY, O.—Zenith Tire & Rubber Co., 450 Leader-News Bldg., Cleveland, proposes constructing 3 story 100 x 620 ft. factory, 1 story 64 x 160 warehouse and 3 story 50 x 100 office building, rein.-con., brick and steel. $750,000.

OKLAHOMA.

MUSKOGEE, OKLA. — Preliminary plans for the construction of an enormous cotton warehouse, to be built in Oklahoma, are under way according to M. C. Harper and J. M. Daily. A warehouse will be erected in this city in the near future.

OKLAHOMA, OKLA.—Liberty Natl. Bank proposes remodeling brick, rein.-con. and steel bank. $125,000.

OREGON.

CORVALLIS, ORE. — E. Bergholtz, archt., Spalding Bldg., Portland, receives bid about Sept. 1, for building 4 story, 75 x 100 ft., rein.-con. hotel. $330,000.

MCMINNVILLE, ORE.—A. E. Doyle, archt., Worcester Bldg., Portland, preparing preliminary plans for 3 story college, administration building, 2 story, 66 x 175 ft., gymnasium and 3 story dormitory for women. $400,000.

PORTLAND, ORE. — Houghtaling & Dougan, archts., 329 Stark St., receive bids about Oct. 1, will build 5 story, 100 x 150 ft., brick, steel and stone temple on 11th and Alder Sts., for Elks Lodge. $700,000.

PORTLAND, ORE.—The repairs on Portland High School will be completed under the direction of the Public Building Committee. A new school will be erected at East Deering. These projects will involve $200,000.

SALEM, ORE.—It is proposed to move and enlarge the present heating plant at the State Home for Feeble-Minded at a cost of about $10,000. Fred A. Legg of Portland, archt.

PENNSYLVANIA.

BETHLEHEM, PA.—Bethlehem Natl. Bank proposes building 1 story, 40 x 140 ft., brick and stone bank. $100,000.

MCKEESPORT, PA.—First Natl. Bank receiving bids building 2 story, 60 x 77 ft., brick, steel and concrete bank, 5th Ave. and Walnut St. $100,000. Weary & Alford Co., 1732 South Michigan Ave., Chicago, arhhts.

PHILADELPHIA, PA.—Phila. Electric Co., 100 Chestnut St., will build concrete and brick substation, at 52-54 North 6ht St., J. R. Wiggins Co., Otis Bldg. I137,500.

ROCHESTER, PA.—H. C. Fry Glass Co. will build 2 story, 80 x 320 ft. and 90 x 120 ft., steel and corrugated iron factory. $350,000.

RHODE ISLAND.

KINGSTON, R. I.—Rhode Island State College will build 3 story, 54 x 120 ft., brick, concrete and granite college. $150,000.

TENNESSEE.

MEMPHIS, TENN. — Presbyterian Churches of South raising $1,500,000 funds to construct University. Address B. A. Bogy, Chamber Commerce Bldg.

NASHVILLE, TENN.—Protestant Hospital plans to build brick addition on Bway. $300,000.

VIOLA, TENN.—Bldg. Com., Bd. Educ., constructing high school. M. Brown, chn. C. K. Colley, 4th St. and 1st Blvd., Nashville, archt.

VIRGINIA.

HOPEWELL, VA.—Mayhew Steel Products Co., Inc., 291 Bway., New York City, will construct plant, including 3 one story buildings, rein.-con. and brick, to Harrison Constr. Co., 15 McIl. Bldg., Petersburg, Va. $150,000.

RICHMOND, VA.—Amer. Tobacco Co., 2400 East Cary St., will build 4 story, 56 x 60 x 197 ft., brick factory, on 24th and Cary Sts., to Ferro Concrete Constr. Co., Richmond and Harriet Sts., Cincinnati. $150,000.

RICHMOND, VA.—Larus & Bro. Co., 7 South 21st St., will build 5 story, 110 x 172 ft., rein.-con. factory, on 21st and Main Sts. $150,000.

WASHINGTON, D. C.

WASHINGTON, D. C.—District Carpenters Union let contract building 3 story, brick and limestone hall on 6th St., to A. Murray, 729 12th St., N. W. $100,000.

WASHINGTON, D. C.—M. Brooks & Co., 1105 G St. N. W., will build 5 story, 40 x 110 ft., brick store. $125,000.

WISCONSIN.

APPLETON, WIS.—St. Elizabeth's Hospital receives bids in fall for building hospital. $500,000.

APPLETON, WIS. — St. Elizabeth's Hospital receives bids in fall building hospital. $500,000.

CEDAR GROVE, WIS.—Bank of Cedar Grove will build 3 story, 41 x 150 ft., brick and tile, on Main St., to Verhulst Bros., 1615 Erie Ave., Sheboygan.

CEDAR GROVE, WIS.—Presbyterian Church proposes building 2 story, 84 x 105 ft., brick, rein.-con. and steel church on Main St. $100,000.

CORNELL, WIS.—Cornell Wood Products Co. will build 2 story, 88 x 300 ft. and 44 x 320 ft., rein.-con. plant. $1,000,000.

KAUKAUNA, WIS.—Thilmany Pulp & Paper Co. will build 3 story, 100 x 200 ft., concrete, steel and brick addition to mill.

MILWAUKEE, WIS.—A. Goethel Co., 301 4th St., proposes building 1 story, 60 x 120 ft., concrete and mill construction factory, on 32nd St.

MILWAUKEE, WIS.—E. Brielmaier & Sons Co., archts. and engrs., University Bldg., constructing 5 story, 46 x 120 ft. and 48 x 50 ft., rein.-con. and brick hospital addition on 12th St., for Mt. Sinai Hospital, 246 12th St. $300,000.

OSHKOSH, WIS.—Oshkosh Motor Truck Mfg. Co., High St., will build 1 story, 100 x 450 ft., brick and concrete assembling plant. $150,000.

OSHKOSH, WIS.—Bd. Educ. will build 3 story addition to Punhoqha School, concrete and brick. $204,997.

SCANDINAVIA, WIS. — Scandinavia Academy will build 3 story, 50 x 100 ft., rein.-con. and brick school to Beck Eng. Co., Plymouth Bldg., Minneapolis. $100,000.

SHEBOYGAN, WIS.—Helming Bros. Co., 912 South 9th St., will build 2 story, 59 x 150 ft. rein.-con., brick and steel garage on Erie Ave. $100,000.

STEVENS POINT, WIS.—First Natl. Bank will build 1 story, 54 x 82 ft., brick and concrete bank. $100,000.

WEST BEND, WIS.—Schmidt-Storck Wagon Co., Mill St., will build 1 story, 100 x 300 ft., brick, rein.-con. and steel factory on Main St., to P. Berres, West End. $100,000.

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IF the National Pneumatic Co. had erected a "modern" structure of conventional design they would have been far less pleased than they are with the striking building here shown.

The roof is neither monitor nor sawtooth; its two patented Pond Trusses, with the low Pond A-frame between, create outgoing and incoming air movements respectively, that ventilate the central floor area perfectly, as well as lighting it.

And the Lupton Pivoted Factory Sash in the walls gives abundant light, with ample fresh air for machine shop needs.

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National Pneumatic Co., Rahway, N. J. Conrad F. Neff, Architect. Pond Continuous Sash used in all roof openings: Lupton Pivoted Factory Sash in walls.

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Lupton Counterbalanced Sash—*Cat. 10-LCB*
Lupton Steel Partitions and Doors—*Cat. 10-LSP*
Lupton Rolled Steel Skylight—*Cat. 10-Misc.*
Pond Continuous Sash, for Pond Truss roofs, monitors, saw-tooths, and side walls—*Cat. 10-PCS*
Pond Operating Device for long lines of sash—*Cat. 10-PCS*

DIGEST
Of Manufacturers' Data

ARCHITECTS' OFFICE EQUIPMENT

INKS:
Higgins, Chas. M., & Co., 271 9th St., Brooklyn, N. Y.

PASTES:
Higgins, Chas. M., & Co., 271 9th St., Brooklyn, N. Y.

PENCILS:
Dixon Crucible Co., Jos., Jersey City, N. J.

CASEMENT WINDOWS

METAL:
Crittal Casement Window Co., Detroit, Mich. Crittall metal casement windows for office buildings, banks, public buildings, churches, university buildings, hospitals, residences, stores, factory offices, etc.

CEMENT AND PLASTER

CEMENT:
Atlas Portland Cement Co., The, 30 Broad St., N. Y. C. Manufacturers of Atlas Portland Cement and Atlas-White Portland Cement. Sales Offices: Chicago, Philadelphia, Boston, St. Louis, Minneapolis, Des Moines, Dayton, Savannah. Mills: Northampton, Pa.; Hudson, N. Y.; Hannibal, Mo. Sales Manager, C. A. Kimball.

CORNER BEADS:
Concrete Engineering Co., Omaha National Bank Bldg., Omaha, Neb.

PLASTER:
Best Bros. Keene's Cement Co., Dept. C, Medicine Lodge, Kan., New York, Chicago. "Regular" for base and finish coats, general plastering; "Fine" for all ornamental plastering; Caen stone, etc.; "Coarse" and "Superfine" for art marble.

SPECIALTIES:
Concrete Engineering Co., Omaha National Bank Bldg., Omaha, Neb.

Truscon Steel Co., Dept. 68, Youngstown, Ohio. Representatives in principal cities. Corner beads, "Kahn" curb bars, "Truscon" slotted inserts; "Kahn" adjustable inserts, "Trus-Con" National socket inserts, "Kahn" elastic filler and armor plates for expansion joints.

STUCCO:
American Materials Co., Chicago, Ill.

CLOCKS

WATCH CLOCKS:
Newman Clock Co., Inc., 173 Fulton St., N. Y. C. Newman grille watch clocks.

COLUMNS

WOOD:
Hartmann-Sanders Co., Chicago, Ill.

CONCRETE REINFORCEMENT

BEAM CAGING:
Mitchell-Tappen Co., 15 John St., N. Y. C. S. M. C. for the concrete protection of steel beams, girders and columns.

REINFORCEMENT:
American Steel & Wire Co., Chicago and N. Y. C.

Concrete Engineering Co., Omaha National Bank Bldg., Omaha, Neb.

North Western Expanded Metal Co., 911 Old Colony Bldg., Chicago, Ill.

Truscon Steel Co., Dept. 68, Youngstown, Ohio. Representatives in principal cities. "Kahn" system reinforced concrete, "Kahn" bars, "Rib" bars, "Rib" lath, "Floretyles," "Floredome," etc.; flat and beamed ceilings of all types.

DAMPPROOFING

(See Water and Dampproofing)

THIS department is intended to assist our subscribers in readily determining the names and addresses of manufacturers of products in which they may be interested together with brief data about their material.

The headings and sub-headings are arranged alphabetically and have been selected in accordance with the intent of meeting the architect's thought in preparing his specifications.

If the information desired is not found here, it will gladly be supplied by the Service Department of The American Architect.

KEYSTONE COPPER STEEL

Galvanized Sheets and Roofing Tin

THE COPPER STEEL ALLOY is unequaled for *durability* and *resistance to rust.* Every architect and builder interested in better sheet metal work should insist upon having genuine KEYSTONE quality. Sold by leading metal merchants.

APOLLO-KEYSTONE Copper Steel Galvanized Sheets assure lasting and satisfactory service for cornices, skylights, ventilators, gutters, spouting, eaves trough, and all exposed uses where permanence is an important factor.

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We also manufacture Black Sheets, Corrugated Sheets, Formed Roofing and Siding Products, Fire Door Ternes, Bright Tin Plates, etc. Send for descriptive literature—also refer to our data pages in Sweet's Architectural Catalogue.

AMERICAN SHEET AND TIN PLATE COMPANY
General Offices: Frick Building, Pittsburgh, Pa.

DOORS AND TRIM

DOORS, STEEL:
Lupton's, David, Sons Co., Philadelphia, Pa.

HOLLOW STEEL DOORS:
Edwards Mfg. Co., The, 319-349 Eggleston Ave., Cincinnati, Ohio.

STEEL ROLLING DOORS:
Kinnear Mfg. Co., Columbus, Ohio. Kinnear steel rolling doors and shutters, bifolding doors of wood and steel.

DUMB-WAITERS

Sedgwick Machine Works, 159 W. 15th St., N. Y. C.

ELECTRICAL EQUIPMENT AND SUPPLIES

CONDUITS AND FITTINGS:
National Metal Molding Co., 111 Fulton Bldg., Pittsburgh, Pa. "National" metal molding for surface wiring, "Sherarduct" and "Economy" conduits, "Flexsteel" armored cable, and a complete line of fittings.

Youngstown (Ohio) Sheet & Tube Co. "Buckeye" rigid conduit, "Realflex" armored conductor.

INSULATED WIRE:
Habirshaw Electric Cable Co., 10 E. 43rd St., N. Y. C.

LIGHTING SYSTEMS:
General Electric Co., Schenectady, N. Y.

OUTLET BOXES:
General Electric Co., Schenectady, N. Y.

PANEL BOARDS:
Benjamin Electric Mfg. Co., Chicago, Ill. "Benjamin-Starrett" panel boards.

POWER PLANT EQUIPMENT:
General Electric Co., Schenectady, N. Y.

RECEPTACLES:
General Electric Co., Schenectady, N. Y.

SOCKETS:
General Electric Co., Schenectady, N. Y.

SWITCHBOARDS:
General Electric Co., Schenectady, N. Y.

SWITCHES:
General Electric Co., Schenectady, N. Y.

WIRES AND CABLES (Insulated):
Atlantic Insulated Wire & Cable Co., 52 Vanderbilt Ave., N. Y. C.

General Electric Co., Schenectady, N. Y.

Okonite Co., The, 501 Fifth Ave., N. Y. C. "Caudec" Potheads, "Mauson" and "Okonite" Tape.

ELEVATORS AND HOISTS

CONVEYORS:
Otis Elevator Co., 11th Ave. and 26th St., N. Y. C. Gravity spiral.

ELEVATORS:
American Elevator & Machine Co., Louisville, Ky.

Kaestner & Hecht Co., 500 S. Throop St., Chicago, Ill.

Otis Elevator Co., 11th Ave. and 26th St., N. Y. C. Offices in principal cities of the world. Electric hydraulic, belt and hand power, inclined freight elevators and escalators.

ELEVATORS (Hand Power):
Sedgwick Machine Works, 159 W. 15th St., N. Y. C.

ELEVATOR CABLE:
American Steel & Wire Co., Chicago and N. Y. C.

HOISTS (Ash):
Gillis & Geoghegan, 545 W. Broadway, N. Y. C. "The G. & G. Telescopic Hoist": Model A, hand power, cellar to sidewalk; Model B, cellar to wagon; Model C, like A, but electric power; Model D, like B, but electric power.

Otis Elevator Co., 11th Ave. and 26th St., N. Y. C. Automatic coal and ash hoists, blast furnaces and ship hoists.

EQUIPMENT STEEL

LOCKERS AND SHELVING STEEL:
Edwards Mfg. Co., The, 319-349 Eggleston Ave., Cincinnati, Ohio.

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